

AMERICAN JOURNAL OF PUBLIC HEALTH *and* THE NATION'S HEALTH

VOLUME XVIII, 1928

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AMERICAN PUBLIC HEALTH ASSOCIATION

370 SEVENTH AVENUE

NEW YORK, N. Y.

American Journal of Public Health

and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

VOLUME XVIII

January, 1928

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Published by the American Public Health Association, 370 Seventh Avenue, New York City.
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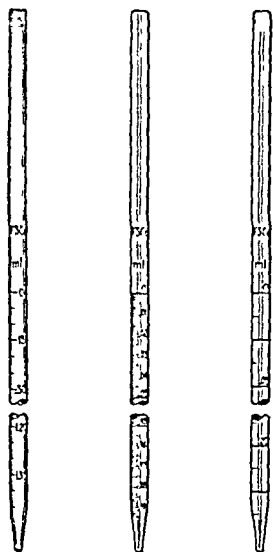
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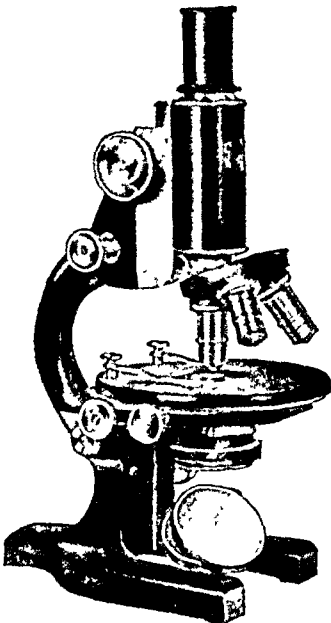
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Published by the American Public Health Association, 370 Seventh Avenue, New York, N. Y.

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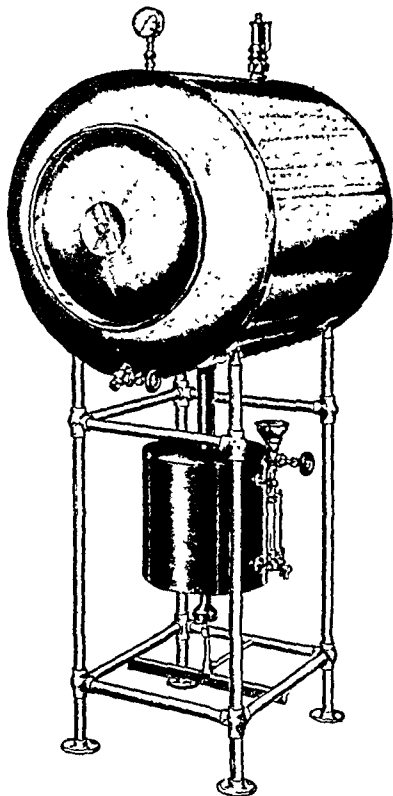
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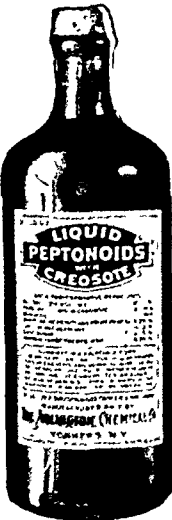
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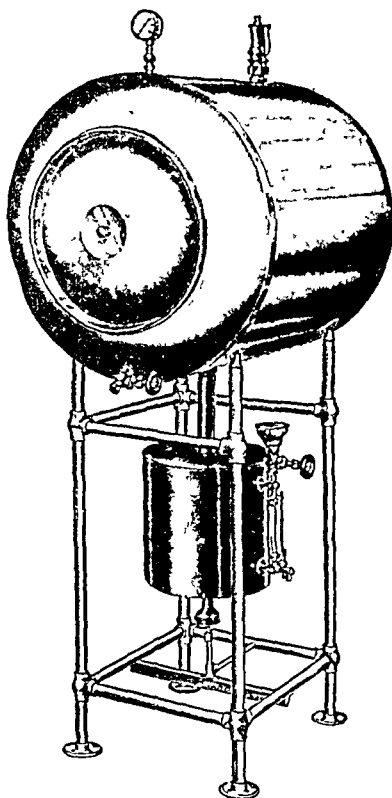
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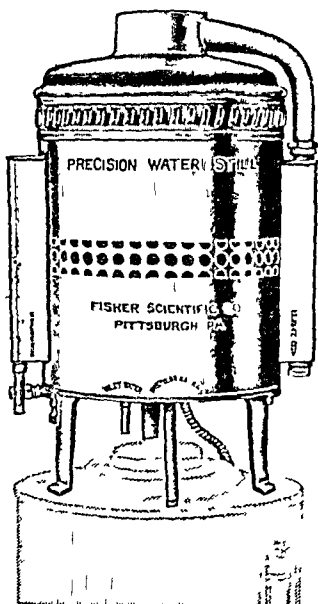
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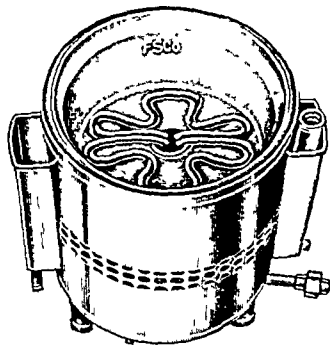
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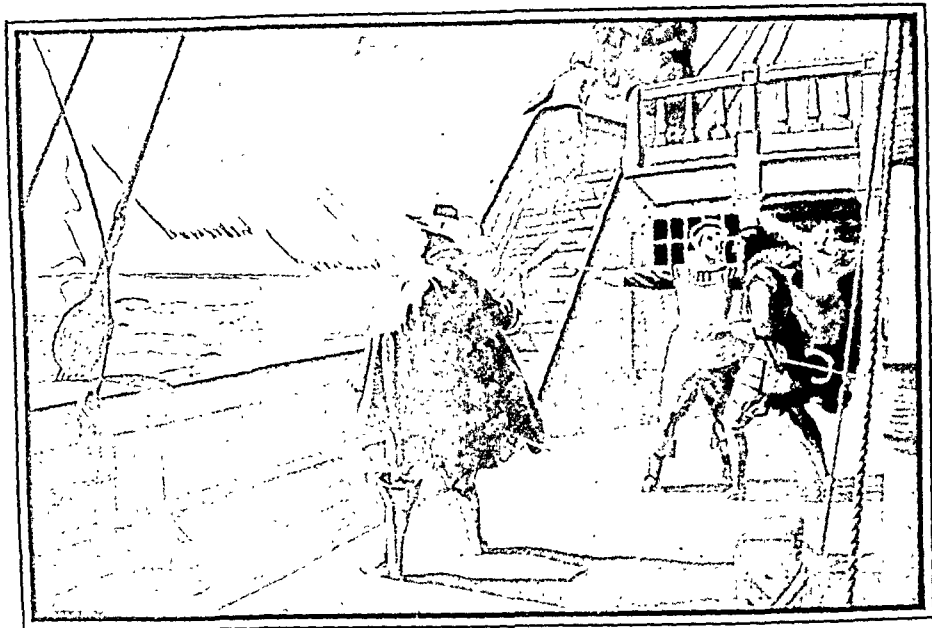
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Widening the Telephone Horizon

*An Advertisement of the
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ASSOCIATION NEWS

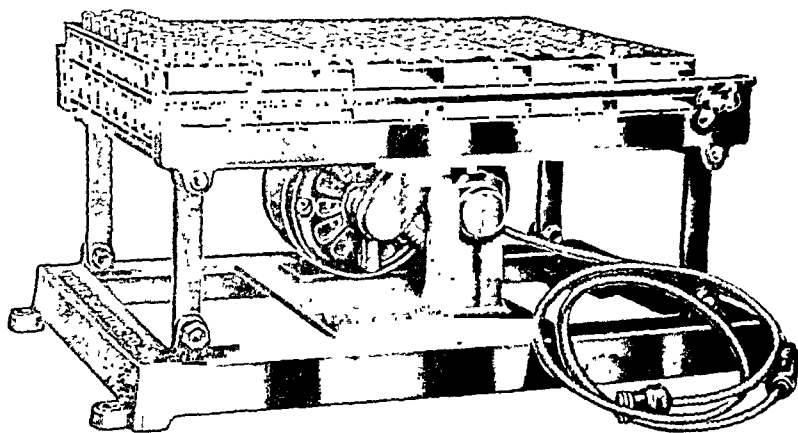
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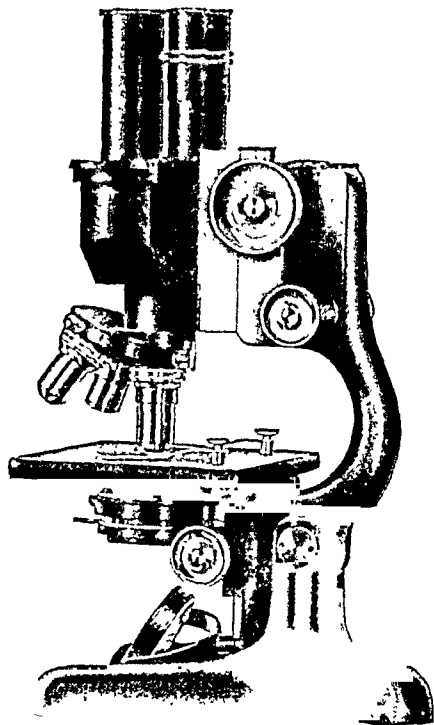
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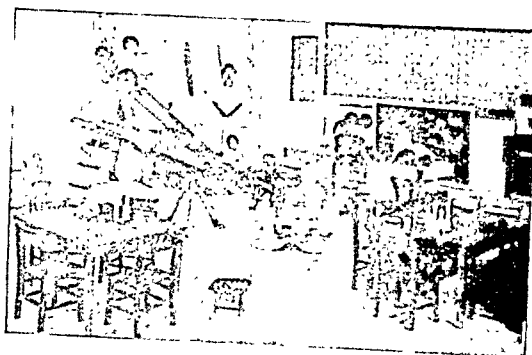
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Published by the American Public Health Association, 370 Seventh Avenue, New York, N. Y.

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Doctor Sun

THE world's greatest physician is located 92,000,000 miles away. He is Dr. Sun. And the one great medicine that he sends is sunlight. On bright, sunny days his free dispensary is open to everybody, everywhere. But in northern latitudes, his treatments—generous applications of ultra-violet rays—are most successful during the summer months.

Sunlight is the finest tonic and health-builder in the world. It works its cures, mysteriously, through the skin. In sunshine there is a wonderful healing power—the ultra-violet rays. These rays are most effective from April to November and are particularly strong from June to the end of September.

Ultra-violet rays do not penetrate ordinary window glass, or clothing except the very lightest in color and weight. Nor do they penetrate, to any great extent, smoky and dust-laden atmosphere. For those who can put on bathing suits and enjoy the sunshine at a beach on ocean, lake, or river, the problem of getting sufficient ultra-violet radiation is solved. But others, too, may receive the benefits of the sun's rays by using ingenuity. At some time during the day the sunshine usually pours into some room in the home where one may lie without clothing in its unobstructed light. A canvas tent without a top, in the yard or on the roof or open porch, will serve.

Sun baths, taken regularly, increase the red corpuscles of the blood in great numbers. The supply of calcium, iron and phosphorus in the blood is augmented. Many physical disturbances partially due to sunlight starvation—notably rickets and anemia—can be relieved by daily sun baths. Certain skin diseases can be healed more rapidly when treated by the sun's rays. Sun baths are a valuable tonic for the organs of the body. The ultra-violet rays kill bacteria and germs.

Dr. Sun's best office hours are in the early morning and late afternoon. At mid-day his treatment is more likely to scorch than to heal. Even at the best hours, over-exposure does more harm than good. It is a mistake to try to get tanned too rapidly. Excessive exposure, especially on parts of the body not accustomed to direct rays of the sun, may cause not only painful burns but also serious skin trouble. Exposure should be gradually increased from day to day.

So essential is sunlight to the body that science sought and has found a way to manu-



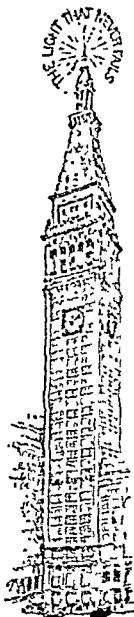
EDWARD J. STEIGER

facture ultra-violet rays that may be used helpfully in the winter and on days at other times of the year when the sun's rays are weak. But great care should be exercised. Artificial sunlight treatments may be extremely harmful if given by anyone not familiar with their power.

In praising the value of natural sunlight, one eminent physician says, "When we have added together all the healing virtues of the Finsen light and Radium and the Roentgen Rays, and all the uses of heat rays and electrical waves in the care of atrophied or unused muscles—when every particular form of radiation has been tried and exploited to the uttermost—the value of natural sunlight upon us, whether as therapeutic in certain forms of disease, or as hygienic and prophylactic, outweighs all these other things as the Atlantic outweighs the contents of the Olympic swimming pool."

Plan, definitely, to store up health. Get your share of the ultra-violet rays in summer, while they are at their best. A booklet, "Sunlight, the Health-Giver," tells of many benefits to be derived from the sun's rays. It will be mailed free upon request to the Booklet Department, Metropolitan Life Insurance Company, One Madison Avenue, New York City. Send for it.

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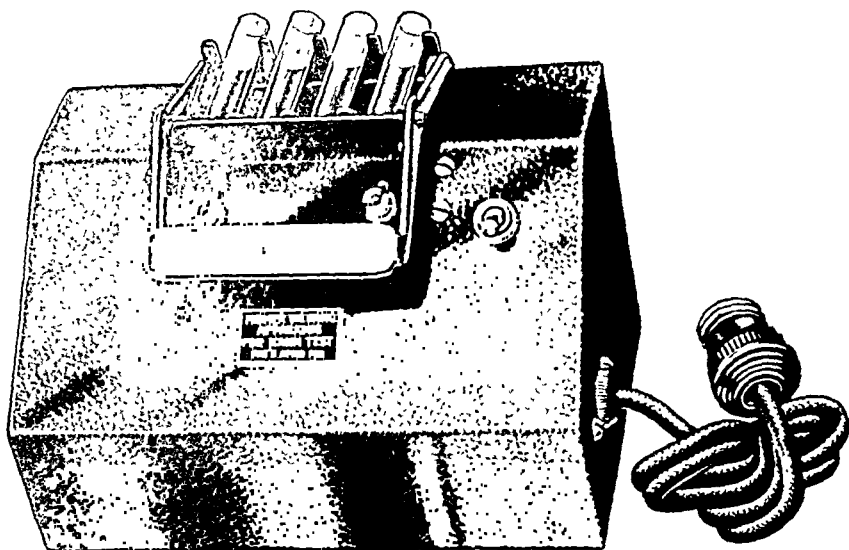
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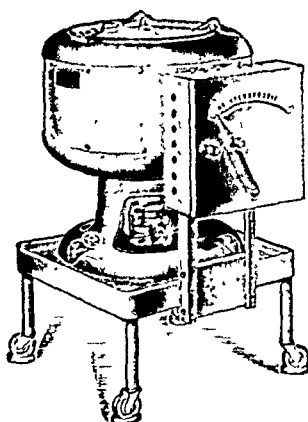
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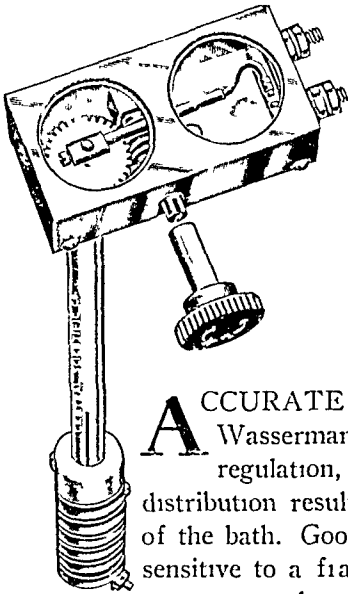
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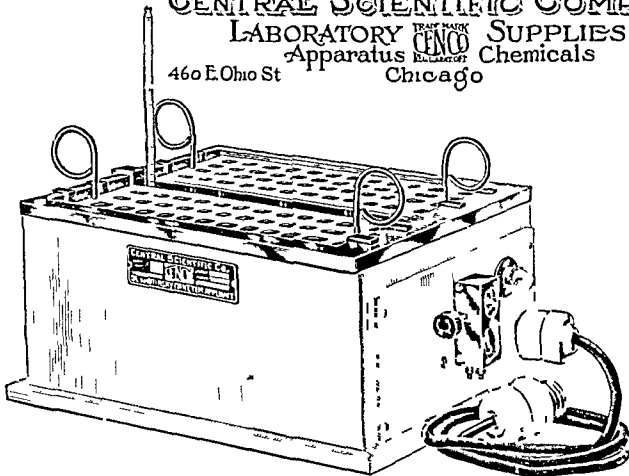
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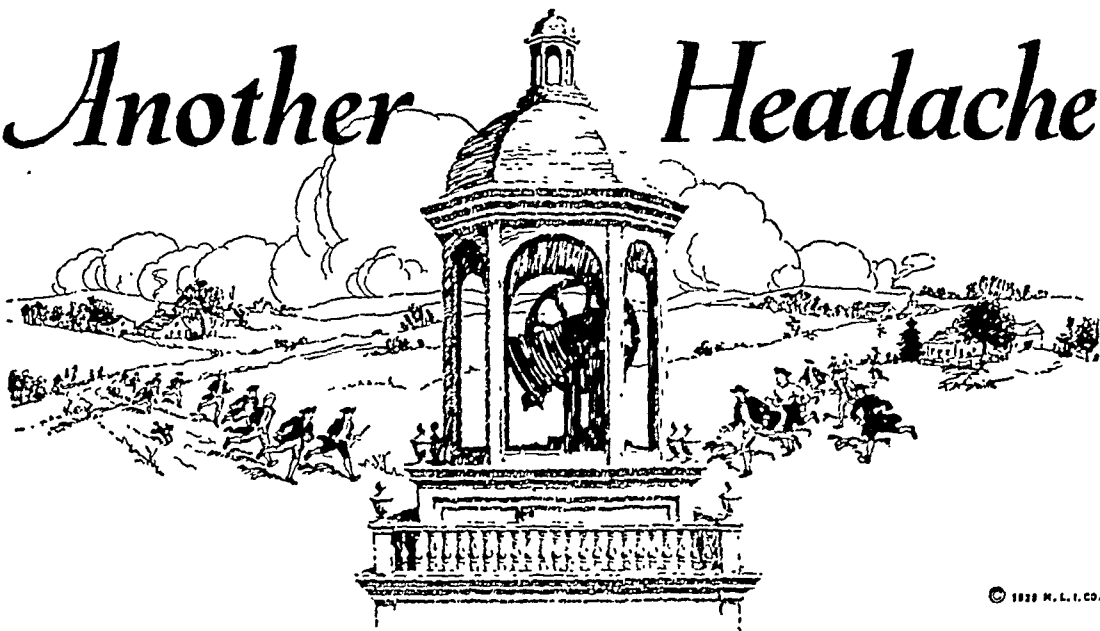
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Another Headache



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"CLANG! Clang! Clang!" rang the bell in the old town-hall and at once the whole countryside was alert. The bell meant danger—usually FIRE!

"Bang! Bang! Bang!" goes the pain in your head—and it, also, is a warning of danger, perhaps grave danger, somewhere in your body.

Can you imagine any villager being stupid enough to cut the bell-rope because the clanging of the bell annoyed him—thus silencing the alarm while the fire raged? When you take a pill, or powder, or wafer to stop a headache, you may deaden the nerves which are carrying an important message of danger to your brain—but the "fire" goes on.

Headaches are usually symptoms of unhealthy conditions, perhaps in some totally unsuspected part of the body. There is almost no physical ailment which does not at some stage manifest itself in headache. Disordered kidneys or liver and intestinal difficulties, as well as nervous strain, infectious and contagious diseases often cause headache.

Fortunately the causes of the vast majority of headaches—indigestion, eye-strain, sinus and teeth infections and wrong posture—can be located promptly. But some of the obscure causes of headache can be found only by patient, skilful search. The trouble may come from a cause so remote from the head as a bone out of

place in the foot or a toxic condition from a diseased gall-bladder.

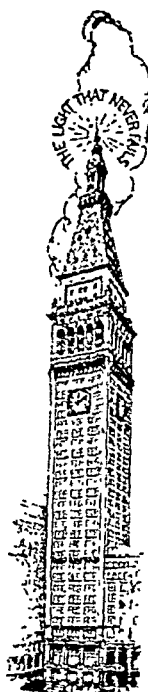
It is risky to attempt to diagnose your own headache. You may guess wrong and waste precious time prescribing for an imagined ailment while the real trouble grows steadily worse. To still the voice of pain without finding its source is like cutting the bell-rope and ignoring the fire.

Beware of headache remedies composed of habit-forming drugs which may injure the digestion, destroy red corpuscles of the blood, undermine the nervous system, depress or over-excite the heart action, and at best may give only temporary relief.

Give your doctor a chance to find the cause. While he is searching for the cause let him prescribe something to relieve the pain, if you must have relief.

A booklet giving helpful information about headache may be obtained free on request to Booklet Department, Metropolitan Life Insurance Company, 1 Madison Avenue, New York City. Ask for Booklet 7 A 8

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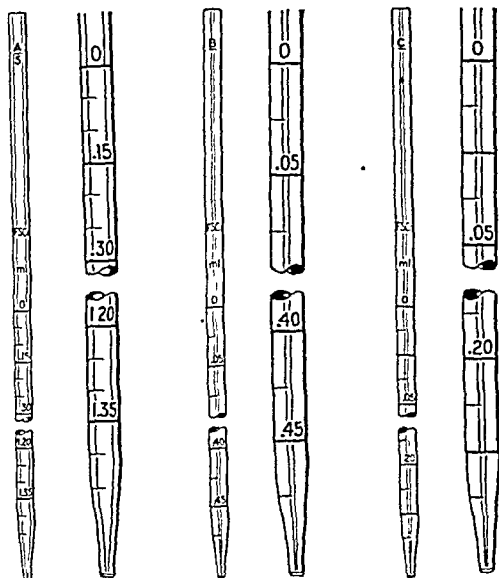


Fig. 1
Pipette
A-S

Fig. 2
Pipette B

Fig. 3
Pipette C

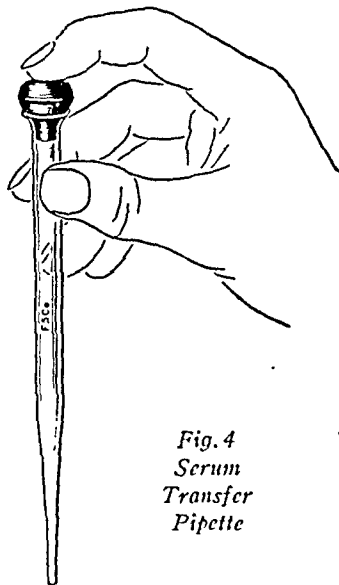


Fig. 4
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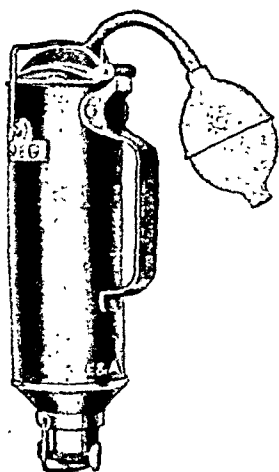
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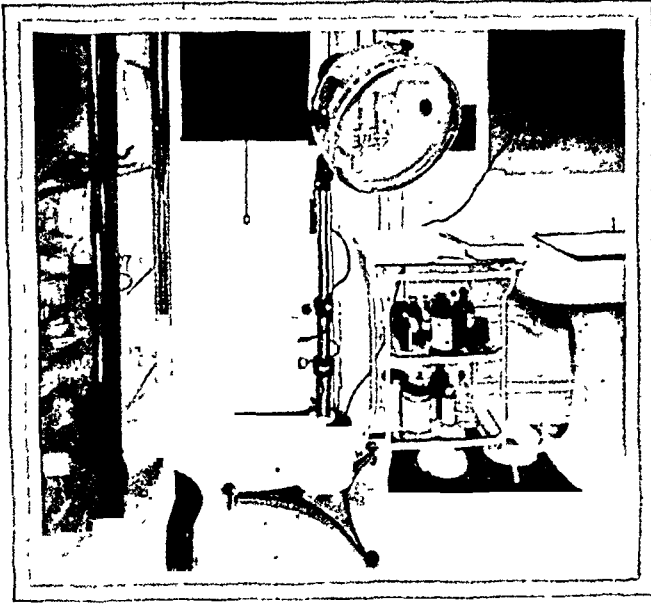
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Published by the American Public Health Association, 370 Seventh Avenue, New York, N. Y.
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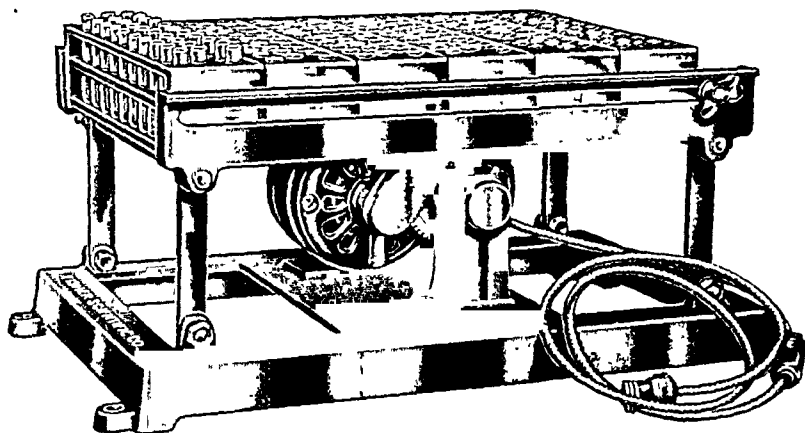
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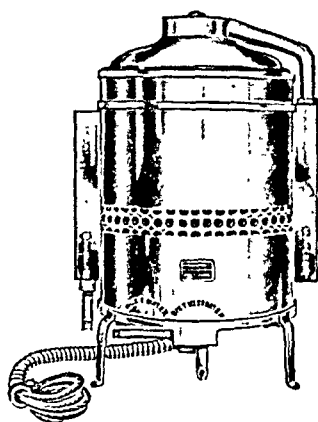
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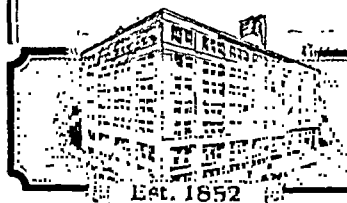
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Knowing of some of the work that has been done by the J. G. Cherry Company in furthering the cause of hygienic milk, Mr. Nathan Straus wrote to us from his New York address, on March First. The above is an excerpt from the letter.

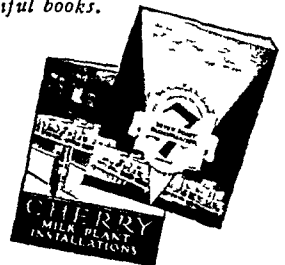
On the occasion of his birthday Mr. Straus sent us the above picture of himself and Mrs. Straus, posed beside a giant birthday cake on which was mounted a single candle.

Among the 500 letters of congratulations received by the noted philanthropist on his birthday were included those from President Coolidge and other leaders of nations of the world. The letters were bound into a volume and were considered by Mr. Straus as the best of the many gifts he had received upon the occasion of his reaching the mark of fourscore years. The benefactor who founded the pasteurized

milk law of New York state and milk stations in this and other lands and who, although once one of the wealthiest men of the world, spent the greater part of his fortune for the benefit of mankind, declared today that his charities are "selfish" in the sense that they do his soul good.

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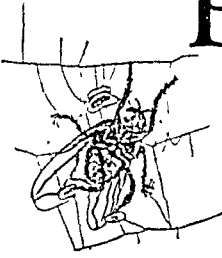
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Beware of Spiders



BACK of a partition where passers-by cannot see him, the loan shark spins his web—and waits. In his show-windows he displays generous-sounding proposals. He says, "We

will trust you when nobody else will—if you have a job."

Sometimes he boldly tells his story on posters and handbills—"Money for salaried men. No mortgages—no indorsement—no collateral—no questions asked. We let you have money at the time you apply for it." He pledges strict secrecy and low rates of interest. He describes himself as "the wage-earner's only friend in time of need"—spider-webs to catch the unwary.

The loan shark knows that the world is full of unfortunate men and women who will promise to pay almost any price in the future for a little cash in hand now.

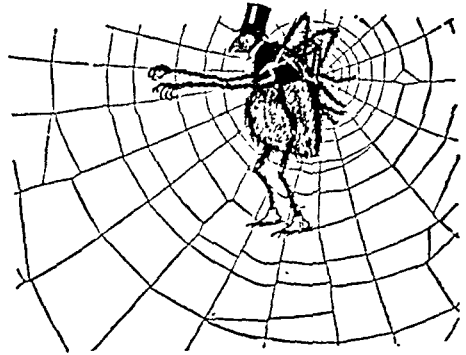
Driven by extravagance or unexpected misfortune, the needy one, when caught, pays a truly terrible price.

The loan shark knows that many of his victims will be unable to pay on the appointed date. He, therefore, extends the time but increases the amount of the loan. Month by month it grows till it crushes. The loan shark's favorite lash on the unhappy victim is "Pay—pay more—or I will expose you. Pay or I will make you lose your job." Sadly enough, sometimes his threat is carried out and the job is lost.

Imagine a frightened employee paying \$2.00 a week "interest" on a \$10.00 loan for three years—156 weeks—and still "owing" the original \$10.00 although he had paid \$312.00. The man who paid this lived in the capital of a great State.

A man who made \$60 a month borrowed \$75 from a loan shark. For a period of three years, he paid each month \$21.85 interest—more than one-third of his wages—without reducing the principal debt.

The man past middle age who has never saved a cent can hope perhaps for but little more than continuing health and steady employment, but younger men and women can and should plan complete financial independence for themselves in their later years of life.



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If you must borrow, make sure the lender is licensed and supervised by the State.

A booklet prepared by the Metropolitan will be of assistance in showing how to avoid the loan shark's web. It will be sent free and without obligation on your part. Address Booklet Department, Metropolitan Life Insurance Company, Number One Madison Avenue, New York City and ask for Booklet No. 9 A 8

Haley Fiske, President.

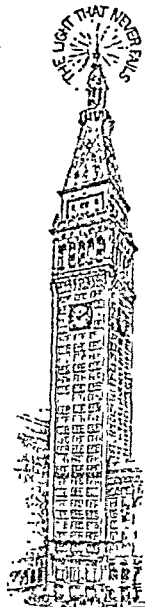
Many millions of dollars are loaned annually by loan sharks. These millions in loans cost borrowers as much more in interest, together with untold mental distress.

Prosecution, though helpful, is not a permanent remedy for the loan shark evil. People still need money and will make any promise for the future in return for present relief. Legitimate remedial and business institutions are therefore necessary. Most States permit the chartering of limited-dividend, semi-philanthropic remedial loan societies.

The Uniform Small Loan Law drafted by the Russell Sage Foundation is in use in twenty-three States and has done much to better commercial money lending conditions in those States.

This Foundation has also assisted in the development of credit unions which are mutual loan and thrift associations. The credit union collects the savings of its membership and relays these savings to finance the individual needs of the same group.

The Department of Remedial Loans offers its assistance in organizing credit unions and remedial loan associations or in advising loan shark victims. Address, Russell Sage Foundation, 130 East 22nd Street, New York, N. Y.



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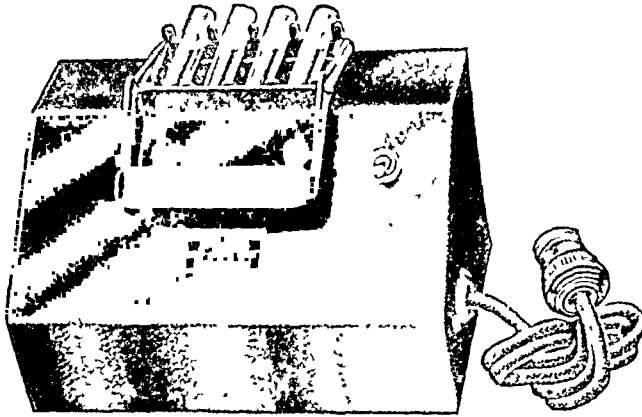
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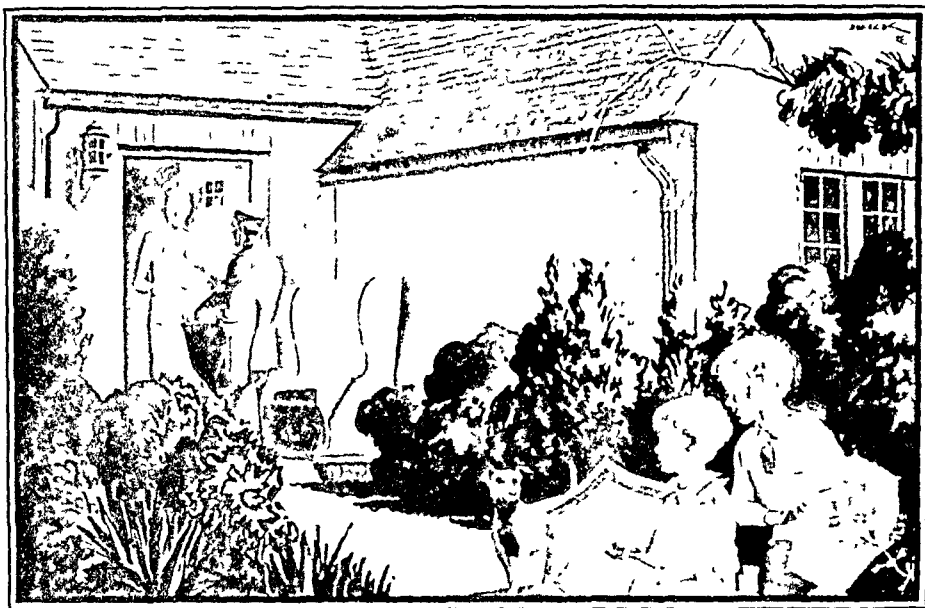
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The Bell System accepts its responsibility to provide a nation-wide telephone service as a public trust.

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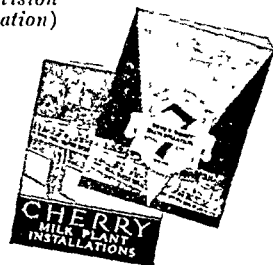
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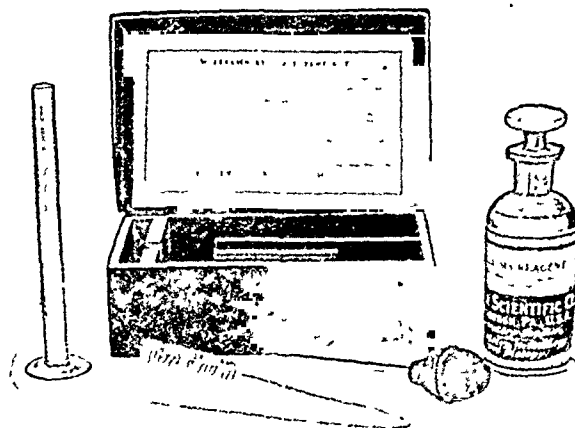
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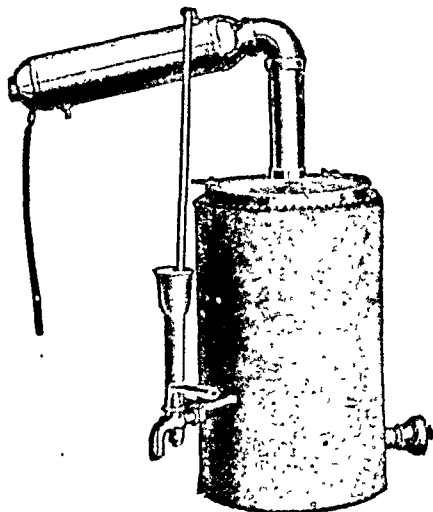
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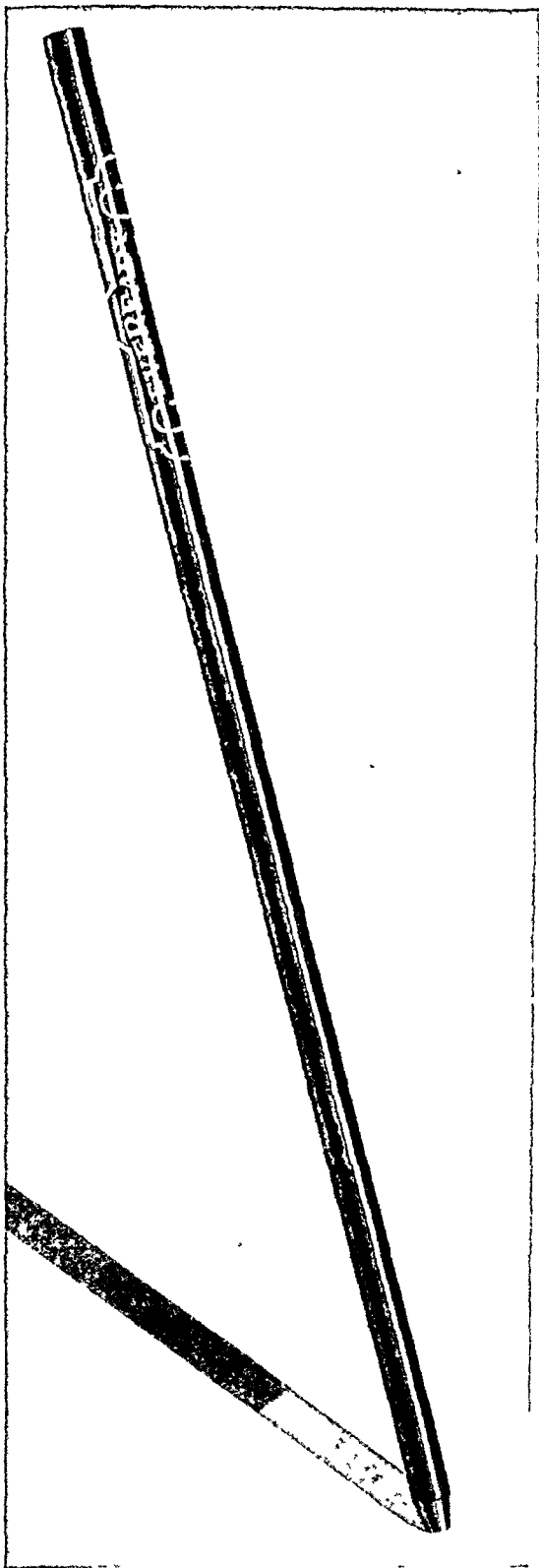
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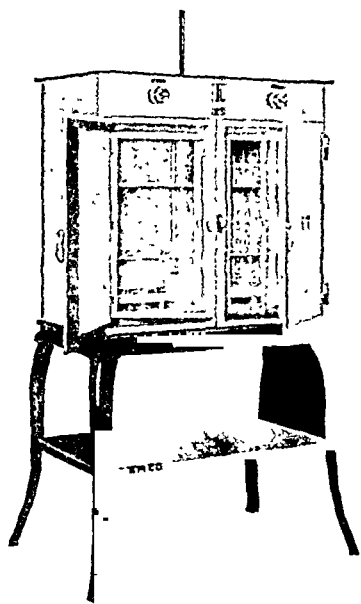
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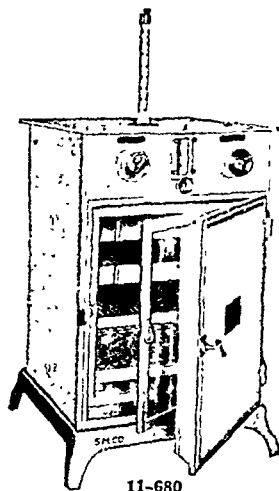
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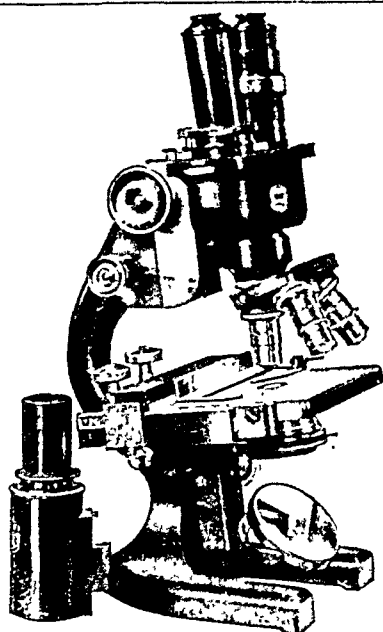
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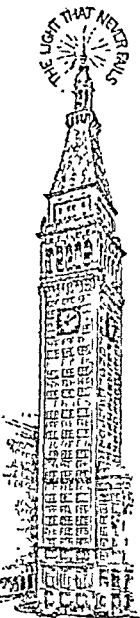
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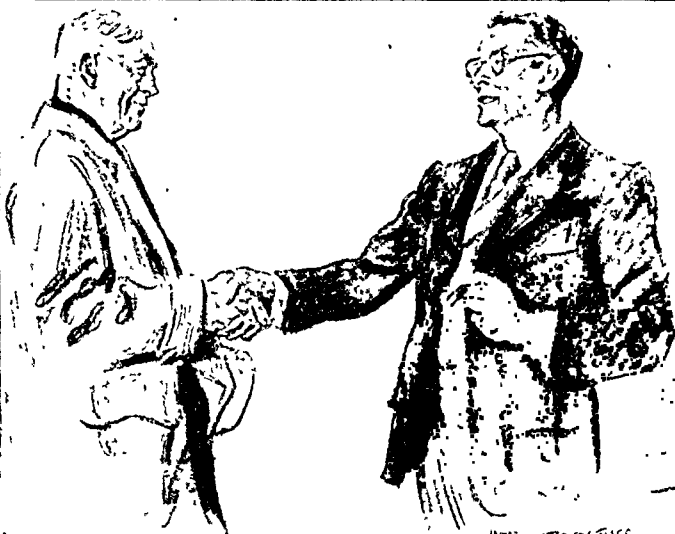
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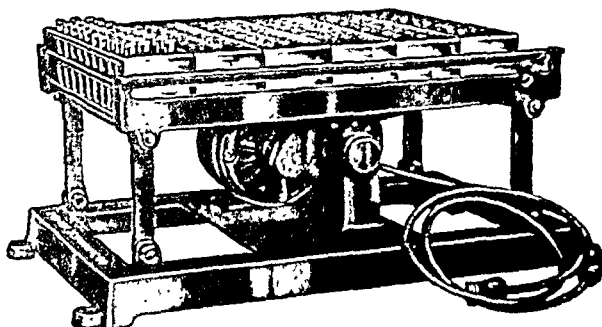
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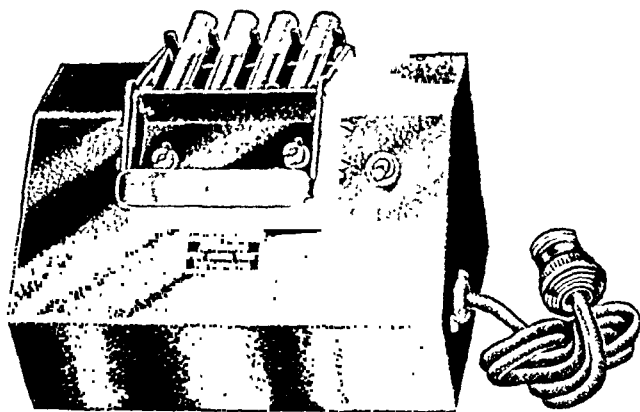
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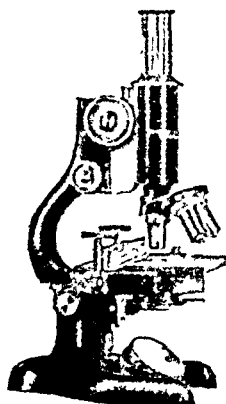
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American Journal of Public Health

and THE NATION'S HEALTH [VOL. X NO. 1]

Volume XVIII

January, 1928

Number 1

Has Prohibition Improved the Public Health?*

LOUIS I. DUBLIN, PH.D., FELLOW A. P. H. A.

I KNOW of no subject which in recent years has lent itself to more acrimonious and futile debate than the effect which the prohibition legislation has had on public welfare. On the one hand, there are those who trace virtually every favorable condition now prevailing in our country, including our unprecedented prosperity, to this enactment. On the other, writers and speakers equally sincere, utterly condemn the amendment and the enabling legislation because of its alleged corrupting and withering influence on the nation. They insist that we are becoming a nation of liars and of petty lawbreakers; that the flood of bad liquor is undermining the morals and health of our youth; and that these evils will grow with the passage of time unless we face about and change materially the letter and spirit of the enforcement law.

It is not my wish to add anything of a controversial character to this debate. I shall try rather to present a few new facts which are now available after a rather painstaking study which bear on the state of the public health during the recent years. I shall attempt to relate these facts to the prohibition situation, but this will not be an easy task. The time that has elapsed is short, the records are often defective, and the results confusing. Nevertheless, if we can keep our discussion free of bias, we may be able to throw light on the relationship between the new legislation and the public welfare.

DEATH RATE AS INDEX OF PUBLIC HEALTH

The best available index of the public health in the United States is the death rate. Reliable figures on the amount of sickness are almost altogether lacking. Two sets of mortality data are available. The first

* Read at the Forum Session of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 20, 1927.

covers the general population residing in a large area of the country, known as the U. S. Death Registration Area as constituted in 1900. These are the 6 New England States, New York, New Jersey, Michigan and Indiana. Together, these 10 states contain 26.1 per cent of the total population of the country. Records of mortality have been kept with great accuracy in this area for the entire period since 1900. These states, moreover, are fairly representative of the country as a whole. While their people live chiefly in urban industrial areas, they have also a fair proportion of rural residents, namely, 25.0 per cent. The second group is composed of millions of men, women and children, who are insured in the Metropolitan Life Insurance Company and whose mortality experience it has been possible to follow very closely since 1911. They live in the cities and towns of the United States and Canada almost entirely. But, fortunately, they form so large a proportion of the communities in which they live that the very accurate figures we have on their life and health will do much to supplement the information that is available from the more limited public sources.

To observe the effect of the prohibition amendment, it is necessary to divide the period covered by the data 1900 to 1926 into two parts, namely, that prior to the adoption of the amendment and the period subsequent thereto. The year 1920 saw the establishment of national prohibition. That year would, therefore, seem to be the dividing line. Practically, it would be better to consider the earlier period as running from 1900 to 1917 inclusive, because the last three years, 1918, 1919 and 1920 were severely disturbed by the prevalence of the influenza pandemic, which distorted the mortality picture and gave an utterly false twist to the trend of mortality during the previous two decades. We shall, therefore, contrast the trends of population mortality in the two periods, that from 1900 to 1917, inclusive, with that from 1921 to 1926, inclusive.

The upper part of Chart I shows what has happened to the death rate in the general population of the original registration states. There was an improvement in mortality in the first 18 years, as is clearly indicated by the sharp downward inclination of the trend line. This is the heavy straight line running diagonally across the chart from 16 per 1,000 on the left in 1900 to a point a little over 14 per 1,000 on the right in 1917. It is the straight line which best shows the tendency of the death rate during the period when the actual death rates varied widely from year to year as is shown by the lighter jagged line. The average death rate in this pre-prohibition era was 15.15 per 1,000 per annum, and the decline over the entire period was 0.10 deaths per 1,000 of population per annum. The second, or what may be broadly called the

prohibition period, from 1921 to 1926, inclusive, presents a different picture. The mortality is on a much lower level than in the earlier years. The 6-year average death rate was 12.58 per 1,000; but, on the other hand, the trend of mortality (again indicated by the heavy straight line) is no longer downward. There is now a rising tendency, the actual rate of rise being 0.09 deaths per 1,000 per annum, or about as rapid an increase as was the decrease in the earlier and pre-prohibition period.

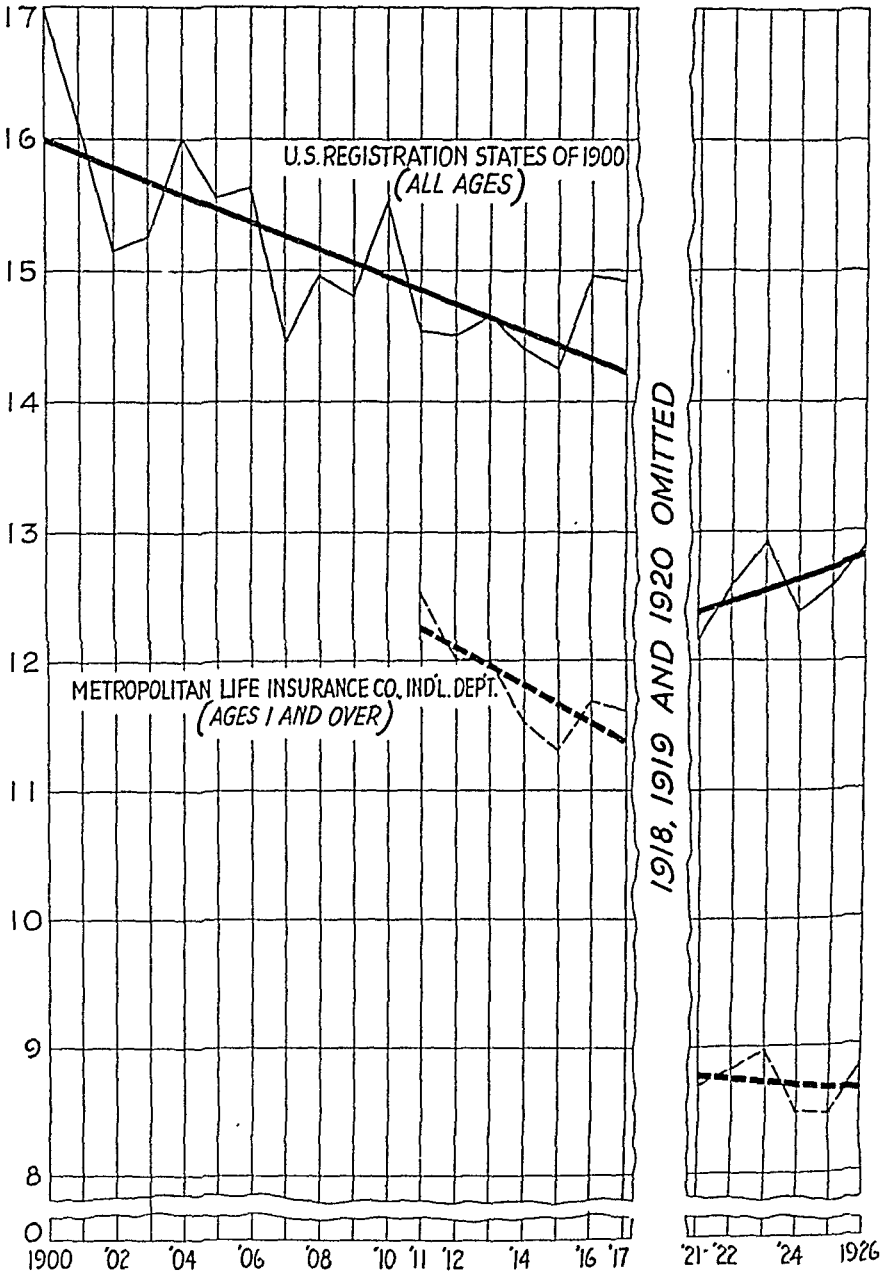
A somewhat different situation appears to have prevailed among the insured lives of the Metropolitan Life Insurance Company, as is shown in the lower part of Chart I. In this urban and industrial population, the average death rate between 1911 and 1917 was 11.81 per 1,000. The mortality declined 0.15 deaths per 1,000 per annum during this 7-year period. In the prohibition years, the average death rate was 8.71 per 1,000. But now we see a trend of mortality which is virtually unchanged, the decline being only 0.01 per 1,000, or 1 in 100,000 per year. This slight change has no significance whatever in view of the short period covered and the marked annual fluctuations of the rate from the average during the prohibition period.

How shall we interpret the figures on this chart? The first thing that comes to mind is the fact that the level of mortality in the prohibition years has been clearly lower than in the earlier years, both in the general population and among the insured. In the general population the average death rate between 1921 and 1926 was 16.9 per cent lower than in the earlier period. Among the industrial policy holders, the average death rate was 26.2 per cent lower in the prohibition period than in the earlier one. Do these lower average death rates, as some have claimed, measure the effects of the prohibition legislation?

Before such a conclusion can possibly be drawn, it must be remembered that long before the prohibition era we were already enjoying a declining mortality, which was thrown temporarily out of line by the influenza epidemic of 1918. The years 1919 and 1920 brought down the mortality rate to a point lower than it had ever been before, although both years had serious influenza outbreaks in the early months. The condition since 1921 appears to be merely a continuation of the downward tendency of mortality during pre-prohibition years, but with its acceleration retarded among the insured and entirely lost in the general population. And it is noteworthy that during these same years, the death rate in most European countries declined appreciably. Such improvement was not limited to those engaged in the World War but affected the countries of Europe almost without exception. The years since 1920 have been generally years of good and improving mortality.

CHART I—TREND OF MORTALITY, ALL CAUSES OF DEATH, 1900–1926, IN THE U. S. REGISTRATION STATES OF 1900; AND 1911–1926, METROPOLITAN LIFE INSURANCE COMPANY, INDUSTRIAL DEPARTMENT

DEATH RATES PER 1000



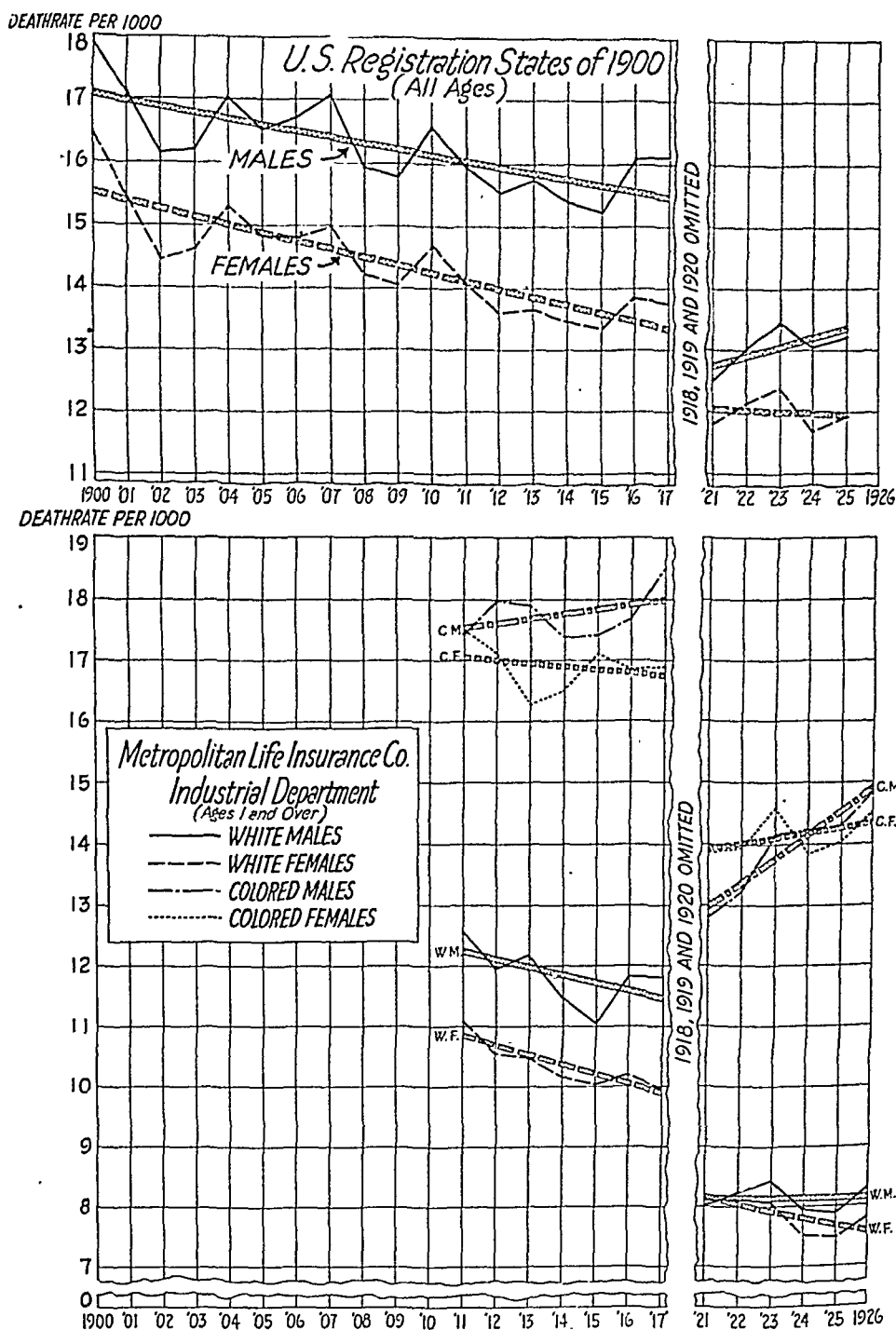
The effect of such a movement as prohibition on the death rate would be expected to become cumulative. It would certainly not show its fullest effect at the beginning. According to our figures, the most favorable year of the prohibition period, so far as the mortality of the general population is concerned, was in 1921. Since then, the death rate has been rising in the general population and has remained virtually unchanged among the insured. It might be argued that if prohibition were really a vital force in determining better health conditions, its influence would become more pronounced from year to year. This has clearly not happened in the population taken as a whole. If we had only these figures, the most favorable interpretation we could place upon them would be that the prohibition legislation had come into effect at a time of low and declining mortality and that it had had no appreciable effect in still further improving the mortality of our people.

But, fortunately, we have secured from the Census Bureau at Washington additional data which, supplementing those on insured lives, make possible a dissection of the mortality experience of the entire population into several classifications. The first of these is an analysis by sex and the second, by age. It is entirely possible that a negative result such as we have shown in our first chart may be a composite of conflicting tendencies in the several parts which make up the whole. This will be clearer as we proceed with the discussion of the additional material.

MORTALITY BY SEX

Chart II shows the same data as in Chart I, except that we may now distinguish between the two sexes in the general population and the two sexes for both white and colored persons among the insured. In the upper half of the chart, we see a sharp decline in the mortality among both males and females prior to 1917. From 1921 onward, there is a marked rise in the death rate among the males and a virtually stationary condition among the females. The slight decline of 0.03 per 1,000 per annum, in this sex, is of no significance. In the lower half of the chart for the insured lives, we find an interesting situation. The colored males show a rapidly mounting rate of mortality in the period between 1921 and 1926; among the colored females, the rate of mortality has likewise risen, but the rate of increase is much less than among the males. Among white persons, on the other hand, the males show a stationary death rate; while white females show a sharply declining death rate during the prohibition period. The actual decline among these white females was 0.12 per 1,000 per annum, and there can be no question as to the significance of the decline. In other words, the improvement in mortality during the period between 1921 and 1926,

CHART II—TREND OF MORTALITY, BY SEX, 1900–1925, U. S. REGISTRATION STATES OF 1900; AND BY SEX AND COLOR, 1911–1926, METROPOLITAN LIFE INSURANCE COMPANY, INDUSTRIAL DEPARTMENT.



which was shown in Chart I, was entirely limited to the group of white females. In the light of what we saw happen in the general population, we may safely conclude that there has been a different tendency in the mortality of males and of females during the prohibition years and that there has been a real improvement among white females.

MORTALITY BY AGE

Continuing our argument, we may now examine the mortality situation in the several age groups of the general population and among the insured. The facts are clearly shown in Charts III and IV. The first of these reflects the conditions in the general population of the registration states; the upper half presenting the facts for males, the lower half for females. Concentrating attention on the period 1921 to 1925, inclusive, we find that among males the death rate declined very sharply among children under age 5 and less sharply in the age periods 5 to 9 and 10 to 14. The facts are shown in the upper left hand panel. The age period 15 to 19 already shows a stationary condition in the mortality during the prohibition period and this continues until age 35, after which, each one of the age periods shows a rapidly increasing mortality during recent years. In the female sex, as shown in the lower half of the chart, the situation is slightly different. The declines are unmistakable in the early years of life and continue up to age 35. It is only after age 35 that the mortality decline among females is either retarded or is actually converted into a rising tendency.

Among the insured of the Metropolitan Life Insurance Company, virtually the same situation appears, as is indicated on Chart IV. The facts for white males are shown in the upper half of the chart; those for white females in the lower half. The decline among males from 1921 to 1926 is very sharp at the ages 1 to 4. It is less marked but significant in the age periods 5 to 9, 10 to 14, and 15 to 19. The age period 20 to 24 shows a slight decline. The period 25 to 34 shows no change. From age 35 onward, the death rates show a rising tendency during these prohibition years, and this becomes very marked at the advanced ages. Among the females, the declines are just as sharp in the early periods, that is, up to age 20. But unlike the males, the declines continue during the age periods 20 to 24 and 25 to 34. The rates remain virtually unchanged in the age period 35 to 44. The years 45 to 54 show an insignificant rising tendency and only the age period 55 to 64 shows a rise in the death rate.

We have, therefore, for the first time succeeded in converting a flat and negative composite into a rather interesting series of tendencies in the several component groups of the population, which may help us to

CHART III—TREND OF MORTALITY, 1900–1925, BY SEX AND AGE IN THE U. S. REGISTRATION STATES OF 1900.

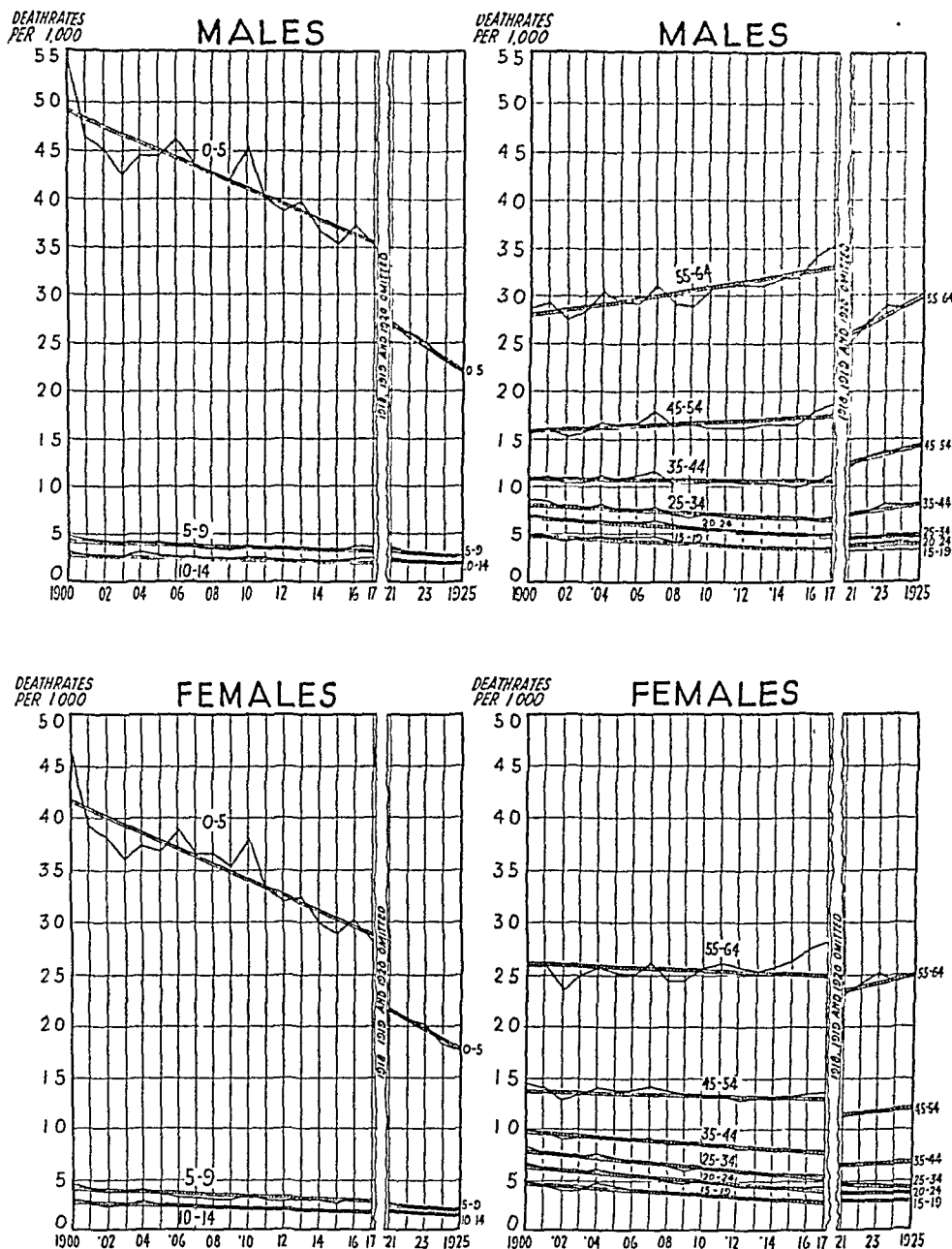
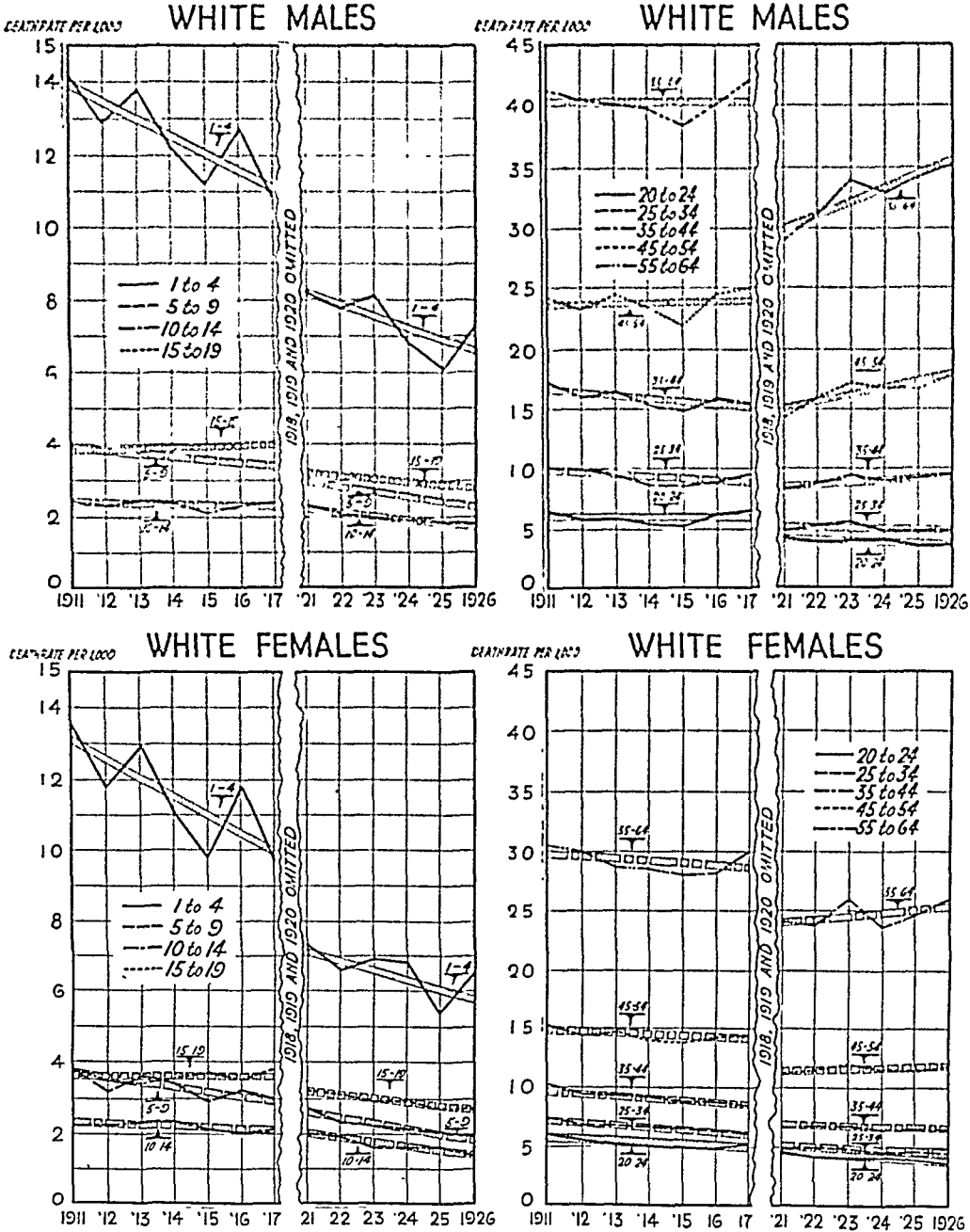


CHART IV—TREND OF MORTALITY, 1911-1926, WHITE PERSONS, BY SEX AND AGE, METROPOLITAN LIFE INSURANCE COMPANY, INDUSTRIAL DEPARTMENT.



answer the question we have for discussion. For one thing, there is now much more agreement in the results of this two-sided investigation. We may summarize our findings as follows: That the prohibition period is characterized by sharply declining mortality rates among children and adolescents of both sexes; and that this decline is characteristic of a number of additional age periods among women. The improvement is retarded among young male adults and disappears altogether during the middle years of life in that sex. In fact, the mortality has definitely risen among men, after age 35. Altogether we may safely say that over half of the total population has experienced a very favorable mortality during recent years. One might even go a bit further and say that the facts are consistent with an assumption that the conditions of life during the period of the new legislation have been beneficial to this large part of the public. A little arithmetic will show that there has been a saving each year of about 14,500 children under age 5, another 2,000 each year between ages 5 and 10 and another 1,000 between age 10 and 20. This makes a total of approximately 17,500 young lives a year.

No one would assume that this gain was entirely the result of the new legislation for reasons we have already given. Many causes have undoubtedly operated to bring this favorable condition about. What some of these are will be made clearer if we examine into the diseases and conditions which have declined among women and children during the 6-year interval since prohibition came into effect.

At the children's ages, the greatest improvement in the death rate has taken place from accidents, from diarrheal diseases and from pneumonia. Infectious diseases have likewise declined considerably. Among young women, the improvement we spoke of is traceable somewhat to a decline in tuberculosis. There has also been a sharp decrease in the mortality from puerperal causes. It would appear, therefore, that the improvement is a response, in some measure, to the direct attack made by health and social service agencies both public and private which has been going on for years against the communicable diseases and against the diarrheal diseases of children. But, in addition, it may be considered a reaction to a rising standard of living, and this is especially evidenced by the lower tuberculosis and the lower pneumonia rates.

The whole picture is consistent with and may well be expected to have arisen (to an appreciable degree) from better conditions within the home, such as more and better food, better medical service and better housing. It is impossible to measure or to say how far any one factor has operated in the direction of reducing mortality. The increased facilities of public health work and the better conditions within the

home have operated together to produce the end result, and it would be entirely unfair to over-emphasize the effect of one of these forces as against the other. In fact, these two activities work best hand in hand and add to each other's effectiveness.

While we may say that the death rate of children and of young women, that is, those who remain at home for the most part, would probably have gone down without prohibition, it would be too much to assume that the conditions within the home during the prohibition years had not been instrumental in furthering the decline. The conditions of domestic life during the last few years have been such as to add incentive and power to the forces already at work to make for better health and longer life in these divisions of the population.

IMPROVEMENT IN ECONOMIC CONDITIONS

Evidence toward this conclusion, which is presented very tentatively, is afforded by the observations of the army of social workers, insurance agents and business men, who from one end of the country to the other are virtually in accord that the years since 1920 have seen an improvement in the economic condition of the homes of the great mass of American people. Never before have savings deposits been so great or have life insurance policies been added to and maintained as during the last 6 years. Retail trade has never experienced such prosperity. All of this emphasizes what is universally observed, namely, that the housewife now has more money to spend on the necessities of the household, on food, on clothing, and on shelter to a degree that has never before been possible for so many. It has been suggested that that part of the wages which under the old régime went into the liquor traffic is now largely diverted into channels which mean increased protection and welfare for the family. But this phase of the subject is unfortunately beclouded with much uncertainty. We know very little that is accurate with reference to the amount of alcohol now being consumed, what is being spent for it, and least of all how the facts shape up for the various economic levels of the population.

RISE IN MALE DEATHS DUE TO ALCOHOLISM

How then does our assumption with regard to women and children tie up with the facts we have given for the condition among men? Why have the death rates for men increased in view of these favorable changes? In that sex, we find that an improvement in tuberculosis has gone hand in hand with an increase in the mortality from pneumonia, from accidents, from heart disease and kidney disease. During this period, there has been a constant rise in the death rate from alcoholism

and from the associated condition of cirrhosis of the liver. Both of these diseases were at a minimum in 1920. They are now at a point almost as high as in the decade prior to prohibition. The picture we have found to exist in the mortality of adult men in the United States is entirely consistent with the observations universally confirmed of a continued widespread indulgence in alcoholic beverages by men. Prohibition has not been particularly effective in that sex and especially has this been true in the cities and, more particularly, in the eastern states.

If the saloon has gone and the great body of men no longer spend a large part of their wages on liquor, it is only too clear that what they do drink now, even if in smaller quantities and at a lesser total cost, is of such a deleterious character, as to result in no advantage to their health. The quality of liquor used throughout the country is sufficiently bad to make up for the smaller quantity consumed. The economic gains help us to understand the condition among women and children; the character of the present supply of liquor helps us to understand the lack of improvement which appears in the mortality of men.

There can be little question as to the unsatisfactory situation now confronting large areas of the country as regards the use of alcohol by men. Beginning with 1920, there has been a continuous and marked rise in the number of deaths resulting from the use of alcohol. In 1920, the death rate from this condition reached its minimum, namely, 1.3 per 100,000. Every year since then, virtually with no exception, has seen a rise and the rate is now more than three times as high as it was only 6 years ago.

The same condition is found to exist among the industrial classes as among those of larger incomes whose insurances are carried in the ordinary departments of the insurance companies. The insurance results are confirmed by the population figures for the several states and this phenomenon is widely observed, larger states showing more strikingly what can be found in the smaller ones with a little more searching. In Maryland, the alcoholism death rate in 1926 was the highest ever recorded since 1911. In Rhode Island, Michigan and New York, the 1926 rate was the highest with a few exceptions.

The records of hospitals for the insane tell a similar story. The year 1920 showed the lowest rate for admissions to hospitals for mental disease due to alcoholism. Since that year, the admission rate has increased step by step and last year saw conditions three times as bad as 6 years ago. It is only too true that in the country over, with very few exceptions, there is a mounting rate from alcoholism and from the associated diseases among the male population.

This situation is in striking contrast with what has occurred in

neighboring Canada. In the Dominion, likewise, several provinces have been experimenting with one form or another of regulatory legislation. But in that country, there is as yet no evidence of any untoward result in the mortality rates for any large group of the population. The experience of the Metropolitan Life Insurance Company in Canada is especially instructive. Among over 1,000,000 policyholders, there have been recorded only 100 deaths from alcoholism and acute alcoholic poisoning during the entire period, 1911 to 1926. On the annual basis, the number of deaths from these causes among Canadian policy holders is so small as to be almost negligible. The death rate from these causes, in fact, is only about a quarter of what it has been among insured lives in the United States. But what is even more interesting is the fact that the deaths from alcoholism have gone down during the last 10 years in Canada—a condition very different from that in the United States. In so far as death rates are a reliable indication, the Canadians seem to have succeeded much better than we in their efforts to control the problem of alcohol and of alcoholism.

DEGENERATIVE DISEASES IN THE UNITED STATES

But there must be no misunderstanding of the true import of these findings. The death rate from alcoholism alone is not high. Deaths from alcoholism and from alcoholic insanity are only a small part of the total. These figures are important not so much on their own account but rather as indications of a condition or habit of life which now prevails. Much more important than the deaths from alcohol are the deaths from the degenerative diseases such as, heart diseases, kidney disease and pneumonia, which are apparently on the rise. Just how far the indulgence in alcohol will explain these increases, it is impossible to say. But, in any case, there is no indication as yet of a tendency toward improvement in these among American men.

EFFECTS OF PROHIBITION NOT UNIFORM

The effect of the prohibition legislation on the public health has clearly not been uniform among the various groups of the American population. This fact probably explains much of the confusion which has existed in the public mind with respect to the influence of prohibition. Many persons have thought of prohibition as if it were a definite and unvarying condition. The facts are very different. Absolute prohibition prevails hardly anywhere and affects as yet only small numbers of people.

We must learn to think of the force of prohibition as varying to a greater or lesser degree with geographical areas, with economic strata

and with the sex and age classes of the population. It is only when considered in this light that we can hope to obtain a consistent answer to our initial question. We may then say that the effect of the prohibition situation on the public health has probably been good where there has been prohibition to an appreciable degree, and the situation has been unsatisfactory to the degree in which there has in fact been no prohibition. Especially is this true in those areas of the country and among those classes of the people where there has been drinking of the highly deleterious stuff that passes for alcoholic beverages these days. Such a conclusion is at once consistent with the facts at our disposal and squares with what has generally been accepted as the true relation existing between heavy alcoholic indulgence and individual health.

This conclusion must not be interpreted, however as an endorsement of the 18th Amendment and of the current enforcement law. This paper is not concerned with the desirability of this type of legislation. Our main purpose has been to discover the facts with regard to the health of our people during recent years. We have disclosed, we believe, certain facts which throw light on the current situation. If it were desired fully to evaluate the prohibition legislation, it would be necessary in addition to these facts on health to consider other items of equal importance in the life of the nation, each one of which would require careful study. The effect of the recent legislation upon public honesty, respect for law and the integrity of public officials, as well as other considerations, will have to be considered with great care. Much time must elapse before these important questions can be considered adequately in the light of the new legislation.

The National Committee for the Prevention of Blindness Annual Meeting

WITH Hon. William Fellowes Morgan, President of the National Committee for the Prevention of Blindness, presiding, the Thirteenth Annual Meeting of the National Committee took place at The Russell Sage Foundation Building, 130 East 22nd Street, New York, N. Y., Thursday, December 15, at 4:30 P. M. Dr. Park Lewis, of Buffalo, Vice-President of the National Committee, and for many years a student of international aspects of saving sight, spoke on: "Prevention of Blindness: A World-wide Problem."

Beginning January 1, 1928, the Committee will be officially known as The National Society for the Prevention of Blindness.

"The Common Cold"

Etiology, Prevention and Treatment*

VOLNEY S. CHENEY, M. D., FELLOW A. P. H. A.

Medical Director, Armour and Co., Chicago, Ill.

IN ALL industries absenteeism on account of sickness is a serious economic problem. In a recent report of the Boston Edison Company covering a period of 10 years, the absences per year on account of sickness were 8.9 calendar days for males and 14 days for females. Among males, sickness caused 12 times as much absenteeism as accidents and the ratio for females was 171 to 1. Respiratory diseases caused nearly one-half of the total number of days lost by men. Out of every 10 men, 4 lost time during the year on account of "common colds." Out of every 10 women, 7 lost time on account of the same cause. Males lost 1.4 days per year and females 2.1 days per year because of colds. Based upon this average, the economic loss caused by "colds," in wages alone, in all the industries of the United States is several millions of dollars and when we also consider the losses due to decrease in efficiency, decrease in production, and the extra expenditures of the invalid, the total is enormous.

There is no medical subject which has greater interest for civilized mankind than that of the "common cold." My experience of many years among the aborigines of the Southwest convinces me that colds, as we know them, are a product of civilization. The layman uses the term "a cold" to cover a multitude of conditions which even the medical man does not always differentiate; viz, an acute coryza; rhinitis; pharyngitis; laryngitis; bronchitis; la grippe; influenza and sometimes tonsillitis.

RESEARCH WORK MEAGRE

There has been a dearth of research work in the etiology of colds, except in an endeavor to prove the theories that a cold was either a primary infection by one or a group of bacteria, or due to a filtrable virus. This lack of research work must be due to the fact that a cold is ordinarily considered a rather trivial affair and one which does not respond readily to treatment but runs its natural course; it cannot be

* Read before the Industrial Hygiene Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 19, 1927.

due to the apparent economic unimportance of a cold, for statistics show that about 45 per cent of absenteeism in most of our large industries is caused by colds or their sequelae. Where it does not cause absence from work, it materially affects a person's efficiency and, in that way, effects also a great economic loss.

The accepted definition for "a common cold" has been "an acute infection of the nasal and pharyngeal regions, or of the upper respiratory tract"; but no one has been able to demonstrate that any one of the many bacteria normally inhabiting the nasal, buccal and pharyngeal cavities, is the cause of a cold, nor has it been conclusively proved that a group of bacteria is responsible for the symptoms we call "a cold." The infectious origin of a cold is only an unproven theory, and a theory based upon a false premise because in the early stages of a cold the secretions from the nose are always sterile and the organisms usually regarded as being the causative factor are only *secondary invaders* of the latter stages.

Another theory as to the etiology of colds is that of a filtrable virus as brought forth by Kruse in 1914, but this theory was also definitely demonstrated as being untenable through a series of experiments by Robertson and Graves in 1924.

The *International Medical Digest*, January, 1927, says:

Summarizing the present knowledge of the bacteriology of common colds, one must say that, as yet, there has not been found any specific organism that can be considered as the etiological factor. The possibility of a filtrable virus as a specific cause for rhinitis is interesting but, up to the present time, the evidence is too conflicting to accept it as a fact.

It soon becomes apparent that for a proper evolution of the causes for colds, one must go further than the study of the bacteria in the upper respiratory tract.

That is just what I have been doing in my study of colds—going beyond the study of the bacteria in the upper air passages and seeking a systemic disturbance of which the syndrome of a cold is only a local manifestation.

I have never been thoroughly satisfied that a cold was only a trivial affair and was primarily an acute infection of the upper respiratory tract. For the past 11 years, I have been making an intensive study of colds, their etiology, their course, both with and without treatment, and the after results or sequelae.

COLD IS NOT INFECTIOUS

The first thing that I want to oppugn is that "a cold is an acute infection." I have been able to disprove this by experiments on a number of people free from cold by trying to inoculate them with the secretions of an individual suffering from an acute cold. As infectious dis-

eases are generally most contagious in the period of incubation or the early stages, I chose the time when the secretions were most profuse for my inoculations. In no single instance was a cold contracted.

If a cold were an acute infection, its origin or source could nearly always be definitely traced; but this is rather a hard thing to do and it is generally turned off with the remark, "I must have been exposed to a cold somewhere." It is true that a cold will frequently run through families and through offices where the clerks are closely associated, but this does not prove that a cold is spread by contact with other persons. These individuals, in the home and in the office, are subjected to the same unhygienic conditions of environment, and those conditions are the factors in bringing about an altered metabolism and a systemic disturbance affecting all the fluids and secretions of the body.

EFFECT OF CLIMATIC CONDITIONS

Climatic conditions have always been held responsible in some way for colds. Inclement weather conditions—of which the chief are severe cold, dampness, windiness, or sudden change of temperature—are frequently considered the exciting or at least a contributory cause of colds. The incidence of colds is generally greatly increased in the winter months and cold weather. Many observers have tried to explain why colds should be more prevalent in cold weather, and the theory most frequently advanced is the disturbing influence of cold upon the heat-governing center, through the autonomic nervous system; but the physiological function of the heat regulating center is to adapt the organism to frequently changing climatic conditions, and in health its regulating function is not easily disturbed.

During the winter months, we lose a part of the actinic effect of the ultra-violet rays of the sun because of its southern declination requiring the rays to pass through a thicker stratum of atmosphere which, especially if smoke-laden, acts as a filter to the rays and materially decreases their chemical action upon the blood, chiefly influencing its calcium content or calcium fixation.

Climatic variations are a contributing factor only so far as they inhibit our normal activities and decrease our utilization of protein foods which are always in excess of what we normally require. We eat too much and exercise too little in cold weather. Colds are less frequent in warm weather because we eat less of high protein foods and exercise more. A lumber camp in which I spent several years and where the men were exposed to all kinds of weather and sub-zero temperature, was particularly free from colds and respiratory diseases. I do not consider cold, *per se*, as an etiological factor.

The times of the greatest incidence of colds in our industry is on Mondays, days following holidays, and days following banquets or parties where there is an abundance of good things to eat. I have also observed that colds are very prevalent in our traveling salesmen and others who are on the road a great deal. While traveling there is a decided change in daily routine compared to the one maintained while at home, a proneness to overeat, drink too much alcoholic stimulants, an increased mental strain, irregularity of the bowels, lack of proper exercise, and loss of sleep. Fatigue, no matter how it is acquired, is a very important factor, and the reason for this is the altered metabolism of the blood and tissues which it produces.

What are the symptoms of a common cold? They vary with the severity of the attack. In a moderately severe one they are coryza, nasal and pharyngeal irritation, headache, muscle-ache, lassitude, anorexia, and malaise. These are also the symptoms of two widely divergent systemic disturbances, one of which is very prevalent and frequently diagnosed—the other is rather rare.

In a study of several thousand cases of colds extending over a period of 11 years, and after numerous unsuccessful attempts to inoculate cold-free persons with the secretions from acute colds, I am thoroughly convinced that an acute cold affecting the upper respiratory tract is not primarily an infection but only a symptom syndrome of a systemic disturbance.

A number of cases of colds of varying severity were carefully studied in the laboratory. Observation was made as to the degree of acidity of the urine; the CO_2 combining power of the blood as an indicator of the alkaline reserve; tests were also made to determine the calcium content of the blood, the sugar content; non-protein nitrogen and the basal metabolism. The urine invariably carried a higher degree of acidity than the normal—in some cases as high as 80° (normal 35°); the CO_2 combining power of the blood in all cases was low, the highest being 52 per cent; the sugar content of the blood was generally decreased (below 100 mg. per 100 c.c.); the metabolic rate was always on the minus side. (These cases were carefully selected because of their lack of any symptoms of disturbed thyroid activity.)

SUMMARIZING FINDINGS

There is a change in the blood chemistry and, consequently, there must be a change in the tissues supplied by the blood. There is a decrease in the bicarbonates or reserve bases contained in the blood plasma and the tissues, notably in that of the sodium and calcium salts; and an increase in the bicarbonate tolerance as determined by Sellard's

test. There is also a change in the activity of the thyroid gland, manifested by a decrease in the metabolic rate; a slight decrease in the sugar content of the blood with a slight retention of non-protein nitrogen. The secretions of the nose and throat are found to be less alkaline than the normal, sometimes having a decidedly acid reaction to litmus paper.

These findings seem to point the way to the conclusion that a cold is a local manifestation of a systemic disturbance; namely, a disturbance of the alkaline balance or reserve, in other words, a mild acidosis, or perhaps better stated, a lessening of the "buffer" action of the blood plasma through a decrease in its bicarbonate content. This conclusion is strengthened by treatment in which thorough alkalization will always abort and cure a cold—a radical statement but nevertheless true, provided the treatment is thorough.

INDUCING ACIDOSIS

I have been able to induce all the symptoms of a cold, in varying degree from a simple coryza to that of la grippe and the "flu," by the induction of an artificial acidosis through the administration of ammonium and calcium chlorides. The degree of severity of the symptoms was in direct ratio to the degree of acidosis induced. In the severer degree of acidosis, all the classical symptoms of the "flu" were present, even including a low degree of fever. The symptoms rapidly subsided upon the administration of sodium bicarbonate in large doses by mouth and by rectum.

AN ABORTIVE TREATMENT

If the disease is attacked when there is a beginning dryness in the pharynx or a slight coryza, or congestion of the mucous membrane of the nose, and alkalization is instituted by large doses of sodium bicarbonate, until the urine is alkaline to litmus paper, a "cold" can always be aborted. Along with the sodium bicarbonate which I generally prescribe in 60 g. doses, accompanied by a large glass of hot water, every 2 hours for 3 doses, I give to an adult 1 g. of calcidin (a calcium and iodine combination) every half hour until 6 doses have been taken.

Most colds begin to manifest themselves late in the afternoon or early evening and the abortive treatment is best given at this time up to retiring. At the time of taking the treatment, the usual meal should be dispensed with, or should consist of milk and some cereal, or soup or broth. If the bowels are constipated, they should not be moved by a cathartic or laxative but the lower bowels should be relieved by a soap suds enema. This treatment will abort colds, if taken in their incipency.

Where a cold has advanced to the stage where there is a hoarseness and a profuse coryza, or where this condition has advanced to what we generally term "a cold," I use the following treatment:

Initial dose 60 g. of sodium bicarbonate and 1 g. of calcidin, then 30 g. of sodium bicarbonate and 1 g. of calcidin every 2 hours for 6 doses, then 20 g. of sodium bicarbonate with $\frac{1}{3}$ g. of calcidin every 3 hours during the waking period until the cold is checked. The administration of the sodium bicarbonate should always be in or followed by a large glass of hot water. Locally, spray the nose and throat with a 1 to 5000 solution of metaphen, or other alkaline solution (1 dram of sodium bicarbonate to one pint of water) morning and night. If the bowels are constipated, I prescribe no laxative or cathartic but use an enema of soap suds to relieve the lower bowels.

Prophylaxis is best maintained by exercise and a diet which is well balanced and thoroughly adapted to the individual's physical activities.

CONCLUSION

Colds and their sequelae including rhinitis, pharyngitis, laryngitis, bronchitis, la grippe, influenza, and pneumonia are not infectious, as we generally consider a disease to be infectious, but are due to a disturbance of the alkaline reserve or balance (acid-base equilibrium). The more severe the degree of disturbance, the more serious the disease.

Conditions capable of producing a mild acidosis or disturbing the "buffer" action of the blood plasma, are contributing factors in producing a cold: a poorly balanced diet, lack of exercise, fatigue, constipation, and infections anywhere in the body. Colds can be prevented by maintaining the alkaline balance through proper diet, exercise, and the careful use of sodium bicarbonate or alkaline waters.

Colds can be aborted by administering sodium bicarbonate in doses large enough to thoroughly alkalinize the system together with small doses of calcidin or iodine and calcium.

Colds can be cured by the administration of the same drugs in smaller and frequently repeated doses.

DISCUSSION

Dr. Wade Wright called attention to Dochez's study of colds in some 40,000 persons. This showed distinct seasonal peaks, the highest late in winter, with the next highest in the fall. These peaks occurred on the Pacific coast the same as in New York City and without relation to temperature changes.

Dr. Emory W. Sink noted that after a football game at Michigan University there were invariably more colds than usual. Was this due to fatigue or to exposure? It has been shown that colds lasted on the average two days longer if cathartics were given. Yet there was something in the psychology of giving medicine of some sort. His general opinion was that there was some contact infection in the production of widespread colds.

Mr. Massey of the Pennsylvania Railroad Company declared that the common

cold was enormously costly to the railroads of the country and that anything that would help in control would be eagerly accepted.

Dr. Robert A. Kehoe considered that with the common cold the most important things were its ubiquity and its sequelae. Certainly the final factor is a germ or organism. It is not proved that some systemic condition precedes the invasion by the organism. Yet what does produce this sudden upset? How do we account for the sudden colds that come out of a clear sky?

Dr. Otto P. Geier was impressed with the frankness and boldness of this paper. He felt that our research investigations in the subject of colds had been getting too far away from the clinical observations; that too much scientific work of this sort is going on—so much as to be indigestible—with the practicing physician left out. The industrial physician has an excellent opportunity for clinical research in the question, and he suggested that others try out Dr. Cheney's methods. He was discouraged with the work of the specialists in the field of the common cold and suggested that industrial physicians discourage the sending of workers afflicted with colds to the specialists. When they do send them the colds usually last two or three days longer. Mondays have always been the worst days for colds, but "blue Monday" is not so bad today as it used to be.

Dr. Alice Hamilton called attention to the experimental work of Mudd and Grant of St. Louis who showed that an actual blanching of the mucous membranes of the nose and tonsils takes place with a chilling of the body. This seemed to be definite proof of primary physical influence.

Dr. A. J. Lanza stated that a prominent industrial physician at a plant employing 10,000 people had tried out argyrol instillations for colds, using controls. He had the patient lie with his head hanging over the end of a table. Argyrol was instilled by the use of a U tube. This plan of treatment was carried out over a long period of observations with generally disappointing results. In fact the patient so treated retained their colds longer than those not so treated.

Dr. Silverman, of Syracuse, did not believe that immunity lay in the question of H-ion equilibrium. The idea of curing colds by disturbing this equilibrium with sodium is too simple. Certainly contact must be recognized as a chief mode of spread and definite causative organisms must be recognized.

Dr. Frank L. Rector stated that certain Australian physicians had noted a sequence in the common cold from the condition of blanching to mucus-excess which exudate produced a favorable culture for the growth of bacteria. Such events supported the common opinion of a predisposed state followed by an invasion of micro-organisms.

Dr. Julius Levy, pediatrician, pointed out that practically all diseases in children were associated with an acidosis. This was true for the gamut of epidemic diseases such as pneumonia, measles, etc. This acidemia should be treated by itself and could not be considered the basic cause of colds, but simply a product.

Dr. Cheney, in closing, stated that the whole theory of infection in relation to immunity must be rearranged. He has had very favorable results in treating scarlet fever with large doses of alkalies. The whole question is a big field for the physiological chemist. In some experimental work he had produced typical influenza in 5 cases by administering calcium chloride and ammonium chloride, and had then promptly cured the condition by alkalization. He did not deny that an invading organism was a later factor in the common cold, but he had found that the blood changes recorded in his paper were all present before infection began.



Figure 1

Artificial Respiration By the Prone Pressure Method*

1. Lay the patient on his belly, one arm extended directly overhead, the other arm bent at elbow and with the face turned outward and resting on hand or forearm so that the nose and mouth are free for breathing. (Fig. I.)

2. Kneel, straddling the patient's thighs with your knees placed at such a distance from the hip bones as will allow you to assume the position shown. (Fig. I.)

Place the palms of the hands on the small of the back with fingers resting on the ribs, the little finger just touching the lowest rib, with the thumb and fingers in a natural position, and the tips of the fingers just out of sight. (Fig. I.)

3. With arms held straight, swing forward slowly so that the weight of your body is gradually brought to bear upon the patient. The shoulder should be directly over the heel of the hand at the end of the forward swing. (Fig. II.) Do not bend your elbows. This operation should take about 2 seconds.

4. Now immediately swing backward so as to completely remove the pressure. (Fig. III.)

5. After 2 seconds, swing forward again. Thus repeat deliberately 12 to 15 times a minute the double movement of compression and release, a complete respiration in 4 or 5 seconds.

6. Continue artificial respiration without interruption until natural breathing is restored; if necessary, 4 hours or longer, or until a physician declares the patient is dead.

* The method and pictures have been approved by:

American Telephone & Telegraph Co.

American Red Cross

American Gas Assn.

Bethlehem Steel Co.

National Electric Light Assn

National Safety Council

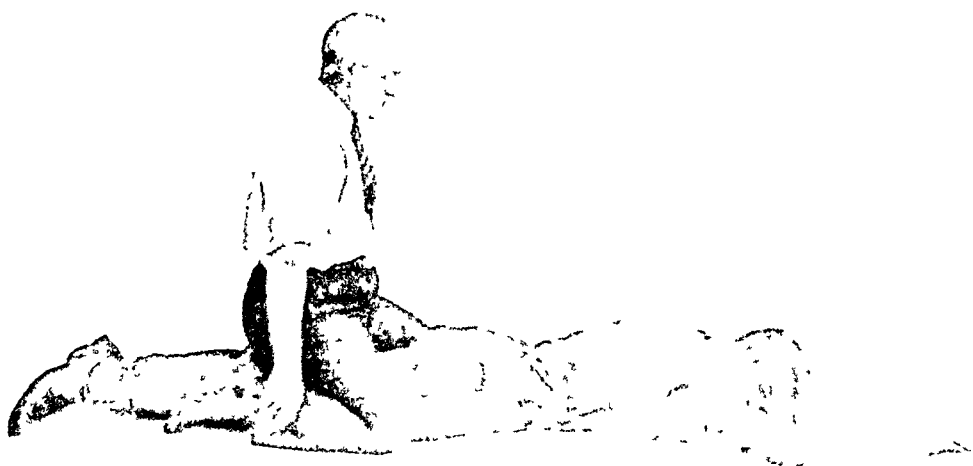
Bureau of Medicine & Surgery, Navy Dept.

Office of the Surgeon General, War Dept

U. S. Bureau of Mines

U. S. Bureau of Standards

U. S. Public Health Service

*Figure II**Figure III*

7. As soon as this artificial respiration has been started and while it is being continued, an assistant should loosen any tight clothing about the patient's neck, chest or waist. *Keep the patient warm.* Do not give any liquids whatever by mouth until the patient is fully conscious.

8. To avoid strain on the heart when the patient revives, he should be kept lying down and not allowed to stand or sit up. If the doctor has not arrived by the time the patient has revived, he should be given some stimulant, such as one teaspoonful of aromatic spirits of ammonia in a small glass of water or a hot drink of coffee or tea, etc. The patient should be kept warm.

9. Resuscitation should be carried on at the nearest possible point to where the patient received his injuries. He should not be moved from this point until he is

breathing normally of his own volition and then moved only in a lying position. Should it be necessary, due to extreme weather condition, etc., to move the patient before he is breathing normally, resuscitation should be carried on during the time that he is being moved.

10. A brief return of natural respiration is not a certain indication for stopping the resuscitation. Not infrequently the patient, after a temporary recovery of respiration, stops breathing again. The patient must be watched and if natural breathing stops, artificial respiration should be resumed at once.

11. In carrying out resuscitation it may be necessary to change the operator. This change must be made without losing the rhythm of respiration. By this procedure no confusion results at the time of change of operator and a regular rhythm is kept up.

Race Betterment Conference

THE Third Race Betterment Conference will be held at Battle Creek, Mich., January 2-6. The object of the conference is to gather the facts of race degeneracy and of recent scientific progress, in the prolongation of human life and to give a greater impetus to the dissemination of these facts for the benefit of humanity. Progress will be reported in the field of bacteriology, medicine, nutrition, eugenics, physiology and education. The conference is being organized under the auspices of Race Betterment Foundation of which John Harvey Kellogg, M.D., is founder and president, and headquarters will be at the Battle Creek Sanitarium. Dr. C. C. Little, president of the University of Michigan is head of the Conference Committee, which also includes Dr. Max Mason, president of the University of Chicago, and Dr. Glenn Frank, president of the University of Wisconsin; Haven Emerson, M.D., Director DeLamar Institute of Public Health, Columbia University.

Among the speakers will be Herman N. Bundesen, M.D., president of the American Public Health Association; Louis I. Harris, M.D., City Health Commissioner, New York, N. Y.; Frederick L. Hoffman, Consulting Statistician, Prudential Life Insurance Company, Newark, N. J.; E. O. Jordan, chairman Department of Hygiene & Bacteriology, University of Chicago; Guy L. Kiefer, M.D., Michigan State Health Commissioner; A. T. McCormack, M.D., Secretary, Kentucky State Board of Health; Mary Swartz Rose, Ph.D., Professor of Nutrition, Teachers College, Columbia University; William Alfred Sawyer, Medical Director, Eastman Kodak Co., Rochester, N. Y.; William F. Snow, President, National Health Council, New York, N. Y.; John Sundwall, M.D., Professor of Hygiene and Public Health, University of Michigan; Harvey W. Wiley, M.D., Washington, D. C.; and Henry F. Vaughan, City Health Commissioner, Detroit, Mich.

Definition of Stillbirth*

IN 1908 the Vital Statistics Section of the American Public Health Association adopted certain Rules of Statistical Practice. Rule No. 19, adopted at that time is:

No child that shows any evidence of life after birth should be registered as a stillbirth.

In 1913 the Vital Statistics Section adopted the following:

RESOLVED, that the present Rules of Statistical Practice relating to stillbirths and premature births as adopted by the American Public Health Association in 1908, should be strictly followed by American registration offices, it being understood, in Rule No. 19, "No child that shows any evidence of life after birth should be registered as a stillbirth," that the words "any evidence of life" shall include action of heart, breathing, movement of voluntary muscle.

So far as is known to the members of this committee, American statistical offices have been strictly observing this rule as amended by the resolution, except that the Province of Quebec has determined the fact of life after birth solely by the act of breathing.

The Health Section of the League of Nations has proposed the following definition of stillbirth, which has been referred to this committee:

A dead-birth is a birth of a foetus after twenty-eight weeks pregnancy in which pulmonary respiration does not occur; such a foetus may die either: (a) before, (b) during, or (c) after birth, but before it has breathed.

The Netherlands and the British Governments have refused to accept it, on legal and scientific grounds.

The proposed definition contains two very distinct propositions. Let us consider these two propositions separately:

First. The desirability of establishing a minimum period of utero-gestation.

Second. That breathing shall be the only acceptable evidence of life to distinguish a live birth from a dead birth.

PERIOD OF UTERO-GESTATION

The very glaring lack of uniformity in stillbirth statistics is found in the period of utero-gestation required as a minimum. In the United States this varies from the requirements of the State of Maryland (all products of conception), to that found on the Statute of the State of Washington (advanced beyond the 7th month of utero-gestation). Many of the state laws, however, have followed the recommendations

* Report of the Committee to Consider the Proper Definition of "Stillbirth," presented to the Vital Statistics Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 17, 1927.

of the Model Law and call for stillbirth reports if the foetus has advanced to the 5th month of utero-gestation.

League Statement—The communication from the Health Organization of the League of Nations, dated April 1, 1925, on page 2 states:

(c) Viability.—In proposing that a gestation of not less than seven months (twenty-eight weeks) shall be the term of development required for a "viable" foetus, the Committee has had in mind the very great difficulty of rearing an infant born after a shorter period of gestation. It is hardly too much to say that the survival of an infant born before the end of the twenty-eighth week of pregnancy is an event worthy of special record. It is rare, except when special facilities—e.g.: provision of an incubator—are available. The adoption of the Committee's proposal will not mean that the birth, at an earlier stage of gestation, of a foetus in which pulmonary respiration becomes established is not to be regarded as a "live-birth" (as hereafter defined); but it will mean that a birth before the end of the twenty-eighth week of pregnancy of a foetus in which respiration is not established is not to be counted as a "dead-birth" but as a "miscarriage" (abortion).

Where registration as a dead-birth is required in the case of a shorter gestation than twenty-eight weeks—e.g.: Switzerland (six calendar months), Japan (four months)—the adoption of the Committee's proposal need involve no change in legislation. In such instances, only those births which take place after the twenty-eighth week of gestation should be included in the principal (international) tabulation. Supplementary tabulations for national purposes could be given, showing the number of births occurring after gestations shorter than twenty-eight weeks.

Now, an examination of medical literature reveals many cases where a child born from the 18th to the 28th week has survived, even for years, and Taylor in *Principles and Practice of Medical Jurisprudence*, March, 1905, Vol. II, page 49, says:

Viability—According to the English law, it is not necessary that a child, when born, should be capable of living, or viable, in order that it should take its civil rights. Thus, it may be born at an early period of gestation; it may be immature and not likely to survive; or again, it may be born at the full period of gestation, but it may be obviously labouring under some defective organization, or some mortal disease, which must necessarily cause its death within a short time after its birth.

Fortunately, these points are of no importance in relation to the right of inheritance: an English medical jurist has only to prove that there was some well-marked physiological sign of life after birth ("Live Birth"); whether the child were mature or immature, diseased or healthy, are matters which do not at all enter into the investigation. It may at first sight appear to be inconsistent with justice that a child which is born immature or labouring under disease, owing to which it can not long survive its birth, should possess the same rights of inheritance as one which is born mature and perfectly healthy; but this evil to society is of far less magnitude than the adoption of a system which must constantly lead to subtle casuistical distinctions, and thereby create error and confusion. So long as there is no well-defined line between a child which is considered capable of living and one which is not, gross injustice must necessarily be inflicted by any rule of law similar to that which is admitted in the French Code.

Without going further into the medico-legal aspects of the question, it is very evident that the French Code differs from the English Code

and that probably the best thing for our section to do is to keep out of the fight and to allow the jurists to thresh out the legal tangle regarding viability.

Census Bureau correspondence shows that 20 years ago, in 1907, careful consideration was given to this subject by Dr. Cressy L. Wilbur. Please note that Rule 16 of the Rules of Statistical Practice was adopted by this section the following year, 1908. This rule 16 reads:

Statement of viability or nonviability of an infant prematurely born shall not be considered in classification.

In view of the existing Rule of Statistical Practice and in view of existing evidence and medico-legal opinions, there seems to be no sufficient reason for urging that the question of viability be considered in the definition of either "dead birth" or "live birth." Moreover, if live births occur before 28 weeks of utero-gestation, it would be unwise to urge that stillbirths before that period need not be reported, for not only is the relationship between live births and stillbirths of each period of utero-gestation a matter of increasing interest and importance, but the lack of necessity of reporting stillbirths before 28 weeks of utero-gestation would make infanticide of premature infants easy to conceal.

The time of quickening is usually given as the 18th week, and the 18th week begins on the 120th day. There is one case of record where a child born in the 18th week was alive at the age of 9 years. As all of these facts center about the 120th day, it seems the logical thing to do to maintain the wording in the Model Law that a stillbirth need not be reported unless it has advanced to the 5th month (i.e., until after 120 days).

The conclusions of your committee are therefore:

1. That Rule of Statistical Practice No. 16 should be reaffirmed.
2. That inasmuch as every live birth, of any period of utero-gestation, should be reported, every stillbirth which has advanced to the 5th month (after 120 days of utero-gestation) should be reported, and that states should carefully consider asking for reports for still earlier periods, as Maryland does today.
3. That the principle implied in the quoted paragraphs of the communication from the League of Nations be endorsed where it suggests that tabulations of stillbirths for international comparisons be made in the various countries for comparable periods of utero-gestation.

The second portion of the proposed definition of stillbirth offered by the League of Nations relates to the evidence of life after birth. It is based upon the hypothesis that the product of conception is a foetus until it breathes. In the propaganda accompanying this definition of stillbirth the accepted definition of birth is unchanged, and it is admitted that a child's heart may beat for some time after birth without efforts at breathing.

This portion of the definition must be considered from the three standpoints of statistics, science and law.

I. STATISTICAL ASPECT

Gross Statistics—If the proposed change would have any effect in modifying vital statistics in general it must be seen in the increased number of stillbirths recorded, and making a corresponding reduction in the living birth record, and the birth rate. It would also decrease the record of infant deaths and infant death rate. Because the number of infant deaths is less than that of births, proportionally the reduction will be greater in deaths than in births. Since infant mortality is computed according to the number of living births, the final result would be a seeming reduction of infant mortality. Manifestly, except where the number of births is very small, this apparent reduction of the infant mortality rate would be exceedingly small. Similarly, except where the population is very small, the reduction in general mortality rate would be infinitesimal.

Because the total number of stillbirths is only a fraction of the total number of births, the most apparent statistical change occasioned by such an alteration of rule would be in the increase of the stillbirth rate. Practically, the results of such an alteration of rule would be negligible, because heartbeat or movement of voluntary muscle is seldom observed when no efforts at breathing have been found.

Confusion and Lack of Exactness—If "breathing" alone, irrespective of degree, is to be the determining factor as to live or dead births, individual interpretation of the expression by physicians and others will create a variation in reports. This is illustrated by two actual examples. In one case the child lived 30 minutes, according to the record, and the physician reported: "This child only breathed four times after it was born. I think it got some of the amniotic fluid into its lungs and choked to death." In another case the record showed that the child lived 2 minutes. "Respiration was feeble." Strictly, these cases should both be reported as live births, but under the proposed evidence of *breathing only*, would not physicians feel justified in reporting them as stillbirths? Did these children breathe, or did they only attempt to breathe?

Changes to be Expected in Birth Rates, Death Rates, and Infant Mortality Rates if the League of Nation's Definition of Dead Births were Adopted in the United States—In the Boston Lying-in Hospital in 1926 there were 1,741 live births; 11 of these infants died within 30 minutes. Of these 11, 4 breathed and 7 did not, i.e., 63 per cent of those who died within 30 minutes did not breathe. These figures indicate that 0.4 per cent of children born alive do not breathe and that the League of

Nations' definition would lower the birth rate 0.4 per cent. Now, of deaths under 1 year about 4 per cent are deaths under 30 minutes and 63 per cent of 4 per cent is about 2.5 per cent; so that an estimate may be made that the League of Nations' definition would lower the infant mortality rate 2.5 per cent. Similar calculations indicate that this same definition would lower the general death rate 0.3 per cent.

These small changes in the birth and death rates are not impressive when we know that errors from 5 to 10 per cent due to defective registration are not uncommon.

The corrective factors indicated are so small that we may conclude that the birth, death, and infant mortality rates of the various countries will be reasonably comparable even though there be no uniform definition of the word *dead born*. As a matter of fact the corrective mortality factors already indicated for the new definition are probably three times larger than they should be, for, to queries sent out by the Census Bureau, satisfactory replies were received from physicians regarding 538 children who died within the first 30 minutes of life, and of this number 433 breathed and 105 did not; i.e., only 20 per cent of those who died within 30 minutes did not breathe.

From the broader standpoint of vital statistics, therefore, the proposed change does not appear to be necessary to make our statistics harmonize with those of countries working under the proposed rule.

II. SCIENTIFIC ASPECT

Neither is the proposed change in definition clearly indicated by present scientific knowledge.

Definitions and Evidence—The term stillbirth or dead birth has universally been recognized as meaning dead at the moment of birth. Death means absence of life. As generally recognized, the status of foetus terminates with birth, provided that the organism is alive at time of birth.

Life of an animal is shown by heart-beat, respiration or movement of voluntary muscles. This is general, and it applies to adults as well as to new-born children.

The report of the Committee of the Royal Statistical Society on stillbirth makes no reference to breathing, but gives as the sole evidence "whose heart has ceased to perform its functions before the whole of the body of such child has been completely extruded from the body of the mother."

The definition offered at the meeting of the International Institute of Statistics in 1913 also makes no mention of breathing, but is based upon "absence of pulsations in the cord, and absence of heart sounds or impulses."

It is chiefly heart-beat upon which physicians today depend for determination of fact of intra-uterine life. Why should it be ignored as evidence of life after the child has been born?

It is well known that it occasionally happens that the heart of a new-born infant may beat for a considerable time after its birth without any efforts at respiration. This is admitted in the communication from the Health Section of the League of Nations. Sometimes in such cases, even after the lapse of 20 or 30 minutes, the child begins to breathe and life is prolonged, and it is recognized as a live birth. The change in the definition of stillbirth proposed by the League of Nations to be perfect must therefore include also a change in the universally accepted definitions of "foetus" and "life." According to this proposal the evidence of life in the new-born would differ from the well recognized evidence of life in adults. Changes in definition are only permitted in science when discovered facts clearly necessitate such alterations.

Confusion—Law looks to science for guidance in such matters. It would be unfortunate for legal purposes if the fact of life could not be determined at the moment of birth, but had to be postponed until artificial respiration had been attempted and its results determined. The League definition seems to be based upon presumptions which have not been scientifically proved; namely, that heart-beat is not a sign of life, or that a child is not really born until it breathes.

If, because it does not breathe, a child is to be pronounced dead at birth although the heart beats for half an hour after birth, what shall be said of a similar child in which respiration is finally established? Was this latter child also born dead, and was it "raised from the dead"?

Foetus, or Foetal Character?—Before it is born the child is not an independent organism, because it depends entirely upon the maternal body for nutrition and the elimination of waste products. In this stage its lungs are collapsed, and most of its blood passes directly from the right to the left side of the heart through the foramen ovale, and it has no teeth. Normally the air cells of the lungs begin to be expanded immediately after the child is born, and circulation through the funis, by which it was formerly coördinated with the mother is stopped. Eight or 10 days after birth the foramen ovale becomes closed.

The change from "*foetus*" to "child" is immediate, at birth. This is a point of time clearly marked by nature. The change from the foetal condition to that of an individual is gradual. It normally takes 8 days after the birth in its grosser aspects, and years in the final changes. Abnormally any of these changes may be delayed.

Efforts at Breathing, or Expansion of Lungs?—For proper function as an individual it is necessary that enough of the air cells in the lungs

shall expand to satisfactorily aerate the child's blood. Often this does not occur. By the partial operation of the cells of the lungs life may be prolonged a short time, but the child may die 1 or 2 weeks after its birth from the atelectasis which has been present from time of birth, and from a cause operating before or during birth. It is not the fact of breathing, but a *full use of the lungs* which in that regard marks the transition from the foetal character to that of a child. A patent foramen ovale is a "foetal character," even when found in an adult. The very real distinction between *foetus* and *foetal-character* has apparently been entirely overlooked by the proponents of the League definition.

Inconsistent and Conflicting—The Health Section of the League of Nations asks that the organism be called a "foetus" until it breathes. Then by the League definitions it is to be called a "child," but the birth of that child must be recorded as of the time during which by the same definition it was a "foetus." These two requirements are inconsistent and conflicting, and if the expansion of the lungs is imperfect the proposed definition substitutes an imperfect datum for one which is exact. Is the child with marked atelectasis essentially any less foetal than before its feeble respiration began?

Science and Law—Although law looks to science for guidance when scientific points are involved, it may ignore illogical, uncertain and unproven statements. It is very important that the scientific and legal definitions shall be harmonious. It is the moral duty of this Association to promote this harmony. It would be unfortunate if the Association should place itself on record as supporting scientific ideas which the courts would not accept.

Scientific Conclusions—Science is a systematized and classified knowledge of facts. The proposed change in the definition of stillbirth does not appear to be based upon such an orderly classification of known facts. It seems to be based upon misty theory, contrary to established concepts. It is therefore unscientific.

III. LEGAL ASPECT

Vital Statistics Depend on Law—Statistics of birth, stillbirth and death are based upon records of these facts. These records are received in the form of legal certificates. These certificates are required by statutory enactment. The common use of the individual certificates is for legal purposes. Vital statistics, therefore, stands on a legal base and should be in harmony with the law of the land. Although the time for determination of fact of stillbirth or live birth may not be of preëminent importance either statistically or scientifically, the legal definition is sometimes very important. Such cases have consequently been ap-

pealed to the high courts, and there decided by old established rules. These common law decisions stand as law, except where modified by statutory enactment.

Evidence Acquired by Law?—Swinburne's Treatise on Wills,* first published in 1590, was the leading recognized authority for over two hundred years in England. Even to the present day it is the basis of Anglican legal decisions relative to live or dead births. In that book it is written: "Crying is not an only proof of life, since it may be proved by motion, breathing, and *such like*." It will be remembered that Judge Swinburne died before Harvey's work on the circulation of the blood was published, but the clause "such like" covers heart-beat.

With the knowledge of circulation of the blood, the English Courts have admitted heart-beat as evidence of live birth, and American decisions have followed those in England. Title to property and other legal rights may depend upon the decision whether or not a dead child was born alive. The legal registration should therefore be in accord with the legal definition.

Legal Interpretation—Every statute must be interpreted according to the facts known and recognized at the time the statute was enacted. Our present statutes in all the states were enacted when the legal determination of fact of live birth might be made upon the observation of heart function alone. The American Public Health Association has no power to change the laws of the several states. While it is well for leaders in various special lines to call attention to scientific advances, and to the need for statutory changes when such alterations are evident, the proposed change in the definition of stillbirth if adopted by the American Public Health Association could not be legally operative until embodied in statutory law by special enactment, and the necessity for such enactment is not evident. The conclusions of the committee were:

Because the change in definition of stillbirth proposed by the Health Section of the League of Nations so far as relates to evidence is not clearly needed for statistical purposes; and

Because it is not in accord with the recognized facts of science; and

Because it is neither in harmony with Common Law, nor present statutes,

Your committee recommends that the definition offered by the League be not accepted and that the present rules of statistical practice regarding this subject be reaffirmed.

HENRY B. HEMENWAY, *Chairman*

WILLIAM H. DAVIS CHARLES V. CHAPIN

* Swinburne, Henry. A briefe treatise of testaments and last willes very profitable to be understood of all the subjects of this Realme of England, etc. Printed by J. Windet, London, 1590.

The Relation of Public Health and Clinical Laboratories*

THOMAS G. HULL, PH.D., FELLOW A. P. H. A.

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A SURVEY of laboratory work was recently made in the State of Illinois covering the calendar year 1926. Questionnaires were sent to 192 laboratories and 13 public health laboratories. Replies were received from 78, or 40 per cent, which was a good response for the first call without a follow-up reminder.

In Table I, is listed the amount of work actually reported and the estimated total if all laboratories had reported. This estimate is conservative because some of the largest laboratories, as well as the small ones, failed to make returns. The survey omitted the federal institutions, such as the U. S. Army at Ft. Sheridan, the U. S. Navy at Great Lakes, the U. S. Veterans Bureau at Maywood; state institutions such as the Psychopathic Institute, the State University, and the various state hospitals and penal institutions; county institutions such as county hospitals and sanatoriums. A large amount of the work performed by the above institutions is clinical in character although many public health problems are confronted. At any rate, these institutions cannot be considered competitors of private laboratories and hence can be omitted from this study.

TABLE I
LABORATORY EXAMINATIONS MADE BY CLINICAL AND PUBLIC HEALTH LABORATORIES IN
ILLINOIS IN 1926

	Examinations reported in survey	Total Estimated
Clinical Laboratories	619,793	1,735,888
Clinical work	513,301	1,301,200
Public health work	106,492	434,688
Public Health Laboratories	388,993	388,993
Total	1,008,786	2,124,781
Wassermann tests		
Clinical laboratories	45,803	139,829
Public Health Laboratories	88,203	88,203
	134,006	228,032

* Read before the Laboratory Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 18, 1927

"Public health laboratory" work includes here the communicable diseases, milk, water, sewage and oyster examinations. "Clinical laboratory" work includes blood counts, urine examinations, blood chemistry, gastric contents and the like, which is of personal concern to the patient but not the public, whether done in private or hospital laboratories.

In 1926 there were 2,124,881 laboratory examinations estimated to have been done in Illinois by public health and private laboratories.

COMMENT

Recently a letter was circulated among clinical pathologists with the following statement: "The state laboratory has been one of the most important problems confronting the clinical pathologist and vitally affecting his economic status." The writer, who represents one of the national scientific societies, goes on to criticise "the gratuitous treatment of the mass of our population who would consider it an insult to receive coal and provisions free and yet take laboratory state aid as a matter of course."

It is only natural that there should be certain antagonisms at times between clinical and public health laboratories. They have grown up side by side in the last few decades.

Thus in Chicago Dr. W. A. Evans, with others, founded the Columbus Laboratories, in 1894, in an effort to teach physicians the new science of laboratory work so that the physicians could carry out the procedures in their own offices. The next year the Chicago Health Department founded its laboratory.

The figures presented in this survey do not indicate that public health laboratories are a great factor in competition with the private laboratories. After there has been deducted from the 18 per cent of total examinations performed by public health laboratories the specimens from the poor and from penal and charitable institutions, along with the specimens from private physicians which would not otherwise be examined, the work left would not greatly enrich the clinical pathologists.

One of the chief causes for complaint has been the Wassermann test. Although syphilis forms one of the most serious problems with which our health departments have to deal, no constructive program has been offered by those individuals who would like to do more Wassermans. They are at present making the majority of the tests and it is doubtful they would get a very much added increase if the public health laboratories ceased to do them.

This brings us to another factor. The development of laboratory work in a community is the result of agitation and stimulation. Thus there was a sharp increase in the number of sputum examinations following the campaign against tuberculosis beginning in the early nineteen hundreds. A similar increase in Wassermann tests began with the work of the Interdepartmental Social Hygiene Board in 1917. There are many communities now without laboratory service because the people and the physicians there have not been taught the value of laboratory aids. Public health laboratories can be of tremendous service in such instances in agitating and educating, thus enabling private laboratories to get a start or to do more and better work. This is a proper function of a health department in improving the health of the people.

CONCLUSION

It may be stated that the private laboratories have small cause for complaint against competition from the public health laboratories, since the latter make but a small percentage of laboratory examinations, many of which would not otherwise be made at all. On the other hand, the public health laboratories can be of service to the clinical laboratories in the promotion of laboratory work among physicians and populace in a manner that the private laboratories cannot undertake. The public health laboratories should coöperate to the fullest extent with the clinical laboratories, since the latter do more work of a public health nature than do the public health laboratories themselves.

Budapest Congress for Industrial Accidents and Occupational Diseases

THE United States will be represented by prominent sanitarians at the 5th International Medical Congress for Industrial Accidents and Occupational Diseases to be held at Budapest during September, 1928. Emery R. Hayhurst, M.D., is chairman of the National Committee of the United States which consists of Volney S. Cheney, M. D., Chicago, Ill.; R. W. Corwin, M.D., Pueblo, Colo.; Eugene L. Fisk, M.D., New York, N. Y.; Otto P. Geier, M.D., Cincinnati, O.; Leonard Greenburg, Ph.D., New Haven, Conn.; George M. Kober, M.D., Washington, D. C.; W. J. McConnell, M.D., Philadelphia, Pa.; Lloyd Noland, M.D., Birmingham, Ala.; Francis D. Patterson, Philadelphia, Pa.; George M. Price, M.D., New York, N. Y.; Frank L. Rector, M.D., Chicago, Ill.; Wm. A. Sawyer, M.D., Rochester, N. Y.; Henry F. Smyth, M.D., Philadelphia, Pa.; and C.-E. A. Winslow, Dr.P.H., New Haven, Conn.

American sanitarians, physicians and dentists are invited to contribute to the program. Those interested in making contributions are asked to communicate with Emery R. Hayhurst, M.D., Hamilton Hall, Ohio State University, Columbus, O.

Chicago's Tuberculin Testing Program*

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Former Commissioner of Health, Chicago, Ill.

AND

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THE most important, as well as the most prevalent, disease of animals with which health officials have to deal is bovine tuberculosis.

Great strides have been made in the field of the sanitary production of milk and in safeguarding of market milk throughout the United States; yet it must be admitted that but slow progress has been made in eliminating tuberculosis from dairy herds. In the past two years, however, Chicago has advanced rapidly in the latter respect. It is the purpose of this article to review the methods and show the results obtained in her comprehensive campaign to protect the milk supply against bovine tuberculosis. For better understanding of the subject a brief review of the history of tuberculin testing in Illinois will be given.

The first legislative attempt to procure milk from non-tuberculous dairy herds for the City of Chicago was made in the year 1908, when a city ordinance was passed requiring the tuberculin test of cattle furnishing milk to be consumed in the raw state.

This step met with most strenuous opposition from dairymen and unscrupulous cattle dealers, arising principally in the most heavily infected dairy districts of Illinois. Through the efforts and influence of this group of interests a bill, known as the "Shurtleff Act," was passed by the Illinois State Legislature in 1911, which prohibited any city, town or village in the state of Illinois from enforcing the tuberculin test to safeguard the milk supply. This led to the passage of Chicago's first pasteurization ordinance in 1911.

Traffic in diseased cattle in northern Illinois had been engaged in for many years, and it developed still further under the influence of the Shurtleff law, coupled with the fact that neighboring states were requiring the tuberculin testing of cattle. Finally, in 1914, so many diseased cattle were being shipped out of Illinois into the other states

* Read before the American Public Health Association at a special session on Milk, at the Fifty-sixth Annual Meeting at Cincinnati, O., October 20, 1927.

that the federal government placed a quarantine against five of the heaviest milk producing counties of the state. This quarantine prohibited the shipment of cattle either in or out of the five counties unless accompanied by a tuberculin test certificate, issued by a federal inspector.

In 1915, Illinois passed a law which prohibited the entrance of cattle into the state unless accompanied by a tuberculin test certificate. With the passage of this legislation the federal quarantine was released. It is common knowledge, however, that the passage of this law was not entirely effective in preventing the smuggling of diseased cattle into Illinois.

OCCASION FOR TEST

Sane and sound methods of eradicating bovine tuberculosis, which included indemnity for losses sustained by herd owners, have for several years been provided by the federal and state governments.

In certain localities of the Chicago district such aid was not accepted by the dairymen, who apparently expected to rely indefinitely upon pasteurization for making safe what was otherwise an unmarketable product.

Realizing that tuberculosis in herds was on the increase in the largest milk producing counties and that the situation was gradually becoming more acute, an investigation of bovine tuberculosis in relation to the milk supply was made by the State Department of Health.

During the years 1923, 1924 and 1925, Tonney, White and Danforth examined in the Bureau of Laboratories and Research, 329 samples of raw milk to determine the incidence of the tubercle bacillus in this product.

Of the total number of samples examined from all sources, 3.5 per cent were found to contain virulent bovine tubercle bacilli. Of the samples collected from one of the largest milk producing counties, 6.8 per cent proved to be positive.

Three and five-tenths per cent of the total milk supply of Chicago amounts to 43,750 quarts daily, or approximately 15,000,000 quarts a year, which, according to the experimental data, contained living tubercle bacilli.

Examination of the official records of the state and federal authorities showed that the percentage of infection among herds in the counties from which the major part of Chicago's supply was obtained ranged from 25 per cent to as high as 77 per cent. Incidentally, the degree of infection in most counties was proportionate to the amount of milk produced. This statement is not to be construed as meaning that the entire supply was obtained from highly infected herds. On the con-

trary much of it came from herds of more progressive dairymen, both in this territory and at more distant points in which the percentage of infection was very low.

The shortcomings of pasteurization as a sole means of protecting the consumer against bovine tuberculosis was also realized.

Sanitarians are almost unanimous in the opinion that pasteurization is not and never was intended to be a safe corrective for milk from unhealthy cattle, nor a justification for lax and insanitary methods of production of milk. To afford maximum protection to the consumer, milk must be obtained from healthy cattle, produced in a cleanly manner, and pasteurized as an additional safeguard.

With full knowledge of the facts and conditions, as here outlined, the matter was placed before the Advisory Board of the Department of Health, and many of America's outstanding authorities on the subject were also consulted.

That milk, even though pasteurized, should be obtained only from cows free from tuberculosis, and that pasteurization and tuberculin testing of dairy cattle should go forward together was, in substance, the opinion of these eminent scientists.

FUNDAMENTAL FACTS AND PRINCIPLES

Before the inauguration of Chicago's campaign, the following well established facts and principles were accepted after thorough consideration of all phases of the subject:

1. Bovine tuberculosis was prevalent to an alarming extent among the dairy herds supplying Chicago.
2. Living virulent tubercle bacilli were present in the raw milk supply.
3. Bovine tuberculosis is transmissible to the human family through the ingestion of milk containing the bacilli.
4. There occur annually in Chicago many cases of bone and glandular tuberculosis, known to be of the bovine type.
5. The efficacy of commercial pasteurization is dependent largely upon the human element and is not to be relied upon as the sole means of protection against bovine tuberculosis.
6. The economic losses caused by tuberculosis in cattle amount to a stupendous sum annually in the United States and the continued maintenance of diseased herds is economically unsound.
7. The federal and state coöperative plan of eradication is no longer in the experimental stage and has proved successful in eradicating the disease.
8. The foremost authorities of the country maintain that, even though milk may be pasteurized, it should always be obtained from cattle which are free from tuberculosis.

CAMPAIGN LAUNCHED

There seemed to be no rational excuse for permitting such a dangerous and uneconomic condition to continue at the risk of human life.

Accordingly, early in 1925 a campaign to secure milk from tuberculin tested cows was begun. With a view to producing as little disturbance in the industry as possible, the coöperation of the dairymen, city milk distributors and country bankers was conscientiously sought.

Numerous meetings, attended by the producers and their representatives, the city milk dealers and bankers, were held in the Department of Health. The producers pledged their support to the program with the proviso, however, that they be given from 5 to 10 years in which to clean up their herds.

INJUNCTION SERVED

Believing that such an agreement would result in unnecessary delay and perhaps postpone really effective action indefinitely, the Commissioner of Health declared that reasonably prompt action only would be entertained. A certain group of producers then resorted to legal action and, on November 24, 1925, secured in the Circuit Court of Kane County, Ill., an injunction against the Commissioner of Health and 12 milk distributors, restraining them from any further attempt to carry out the program. This effort to intimidate the Department of Health and, in effect, to dictate the kind of milk that Chicago should use, aroused strong sentiment on the part of the public and the press, with the result that, on December 24, 1925, the City Council passed an ordinance, providing that on and after April 1, 1926, all dairy herds supplying milk to the City of Chicago must be free from disease.

The same opposing forces which were responsible for the passage of the Shurtleff law in 1911, again became active. Mass meetings were held throughout the dairy district. Defense funds were raised and every conceivable attempt was made in an endeavor to defeat the enforcement of the new ordinance on April 1. Many contended that its enforcement would force most dairymen into bankruptcy. Others predicted that its enforcement would result in a milk famine in the City of Chicago, and that milk would be advanced in price to 50 cents a quart.

It should not be inferred that all dairymen were opposed to the program. The majority of the producers of the dairy district, as a whole, either were in favor of the movement or did not oppose it. The antis consisted of a relatively small group of misinformed dairymen, cattle dealers and bankers in a few of the badly infected counties. The noise and outcry of this group was out of proportion to its numerical strength. With the Health Department's refusal to relent and its repeated insistence that the ordinance would be strictly enforced on April 1, the distributors exerted active effort to enroll their patrons for the

test and much progress was thus made in a comparatively short time.

ORDINANCE ENFORCED

Beginning April 1, 1926, the ordinance was strictly enforced. It developed that more than an ample supply of milk from approved herds was received and, contrary to prediction, the price of milk to the consumer was not increased.

For the approval of herds, a system was installed whereby every dairyman shipping milk to Chicago is required to have on file in the Department of Health, a certificate issued by the state and federal authorities, as evidence that his herd is under supervision. Much credit is due the various officials in charge of the eradication work for making this possible.

The herd certificates, when submitted for file, are carefully examined and a check is made of the amount of milk produced against the number of cows accounted for on the certificates. The date of the test is also noted, and a record is made indicating when the retest is due. A special file is kept of each dealer, containing the certificates of his patrons. With few exceptions, all of the counties from which Chicago receives its milk and cream supply are either testing under the county area plan, or have county veterinarians who, under the direction of the federal and state officials, conduct the actual testing.

RETESTING HERDS

It was held by many opponents of the measure that, after the first testing, many of the clean cattle with which the herds were replenished would be lost on the first retest. As an evidence of the fallacy of this view, the percentage of infected cattle in the 10 leading dairy counties of the Chicago dairy district on the initial test and the percentage of those reacting on the first retest are presented:

	Initial Test	First Retest
Cattle tested	142,185	55,509
Cattle reacted	57,514	4,244
Per cent reacted	40.4	7.4

TESTED HERDS PROFITABLE

It was contended that many dairymen would have to go into bankruptcy on having their cattle tested, because of the fact that their herds were so highly infected. Testimony has since been given by many dairymen that they are now producing a larger amount of milk from a smaller number of cows than before they tested and disposed of their reactors, and that their veterinary expense and loss from mortality has been materially reduced.

At 13 large milk plants, located in the Chicago dairy district, statistics have been kept concerning the average daily production of milk per cow, both before and after the test. The figures cover herds comprising 30,000 cattle. For the 12-month period after the test the average daily production per cow is given as 23.2 lbs., as compared with 21.5 lbs. before the test, or an increase of 7.3 per cent. The increase given, covering the 30,000 cattle included in the survey, amounts to 18,360,000 lbs. per year, which, at the average price of \$2.50 per cwt. paid for milk, represents a profit of \$459,000.00.

PREMIUM PAID FOR HOGS

Attention is also called to the fact that a premium of 10 cents per cwt. is being paid by the packers for hogs coming from modified accredited counties; that is, counties in which the degree of infection among the cattle in the county is less than 0.5 per cent. This movement has been sponsored by the National Live Stock Exchange, which advanced the following information: The amount of \$342,972.00 was paid in premiums for hogs at Chicago and markets West during the year 1926, one single county in Iowa having received \$23,250.00. The first 8 months of 1927, \$341,691.00 was paid, or an amount almost equal to that paid out during the entire year of 1926.

STATE AND FEDERAL PLAN

In the year 1917 the state and federal coöperative plan of tuberculosis eradication was inaugurated. One has but to review the figures in the August, 1927, report of the Bureau Animal Industry, U. S. Department of Agriculture, in support of the belief that under this plan bovine tuberculosis can be eradicated.

According to this report there now are under supervision 1,887,589 herds comprising 18,091,229 cattle; accredited 137,898 herds comprising 1,877,021 cattle.

This report shows 361 modified accredited counties in the United States; that is, counties where the per cent of infection has been reduced to less than 0.5 per cent. According to latest information, however, this has been increased to 410 counties.

That the importance of this work is being recognized throughout the United States is indicated by the increase in financial support it has received, particularly in the past 2 years.

The federal appropriation for the year 1927 is approximately \$6,000,000.00, or an increase of \$2,500,000.00 over that made in the year 1925 when the Chicago campaign was inaugurated.

The combined states and federal appropriations for the year 1927

are given at \$18,500,000.00, or an increase of \$5,500,000.00 over the year 1925. This does not include appropriations made by counties for the employment of county veterinarians.

The following is quoted from the President's annual message for the year 1927, when transmitting the budget:

The furnishing of pure milk is of vital importance to the health of the people. Because of its interstate character, it is entirely proper that the federal government share with the states the cost of protecting this great food supply. The amount included in the estimates should permit adequate prosecution of the work of eliminating tuberculous cattle from dairy herds. The results of the work already done warrant the belief that we can confidently expect the complete elimination of this menace to health.

That the movement is receiving popular support is evidenced by information received from many cities which have since put into effect similar legislation. Practically all of the smaller cities surrounding Chicago are now requiring that milk come from tested herds.

While the progress thus far made is considerable, the cleaning up of the fluid market milk, though most important, is but one step in the program of elimination of bovine tuberculosis infection from dairy products. The task will not be completed until all such products are required to be obtained from cattle which are free from tuberculosis.

Larson Directs National Dairy Council

THE new director of the National Dairy Council is C. W. Larson, Ph.D., Chief, Bureau of Dairy Industry, U. S. Department of Agriculture since the Bureau was established in 1924. The appointment was made at the annual meeting of the Council in Chicago, Ill., on December 1.

M. D. Munn was reelected president. The other officers elected were: E. M. Bailey, President of American Dairy Federation, Pittsburgh, Pa.; and J. A. Walker, Blue Valley Creamery Co., Chicago Ill., Vice Presidents; T. A. Borman, Beatrice Creamery, Chicago, Ill., Treasurer. C. Bechtelheimer, secretary of Iowa Creamery Buttermakers Assn. was named secretary pro-tem.

The National Dairy Council, representing leaders of the dairy industry in all sections of the country, is devoted to educating the public concerning the benefits of milk and its products. In his presidential address, Mr. Munn said:

Production of milk has increased in the last six years 34.7 per cent. This had been made possible by assured demand, which also had made possible more efficient and sanitary methods of dairying. Nearly all of it has been consumed in this country. Per capita consumption of milk increased 28.6 per cent and butter 21.36 per cent from 1920 and 1926, inclusive.

The changing food habits of the American people have brought about the increase in milk consumption. With the population centered in cities, people are using green foods, fruit and dairy products, the protective foods much more prominently in the diet.

The dairy industry is in a favorable position both as to production and as to present demand, but according to dietary scientists the American people should be consuming 45 per cent more dairy products than they are using at the present time, in the interest of national health and from the standpoint of economy of the food budget.

Herman N. Bundesen, M.D., President of the A. P. H. A., was one of the speakers at the annual meeting of the National Dairy Council.

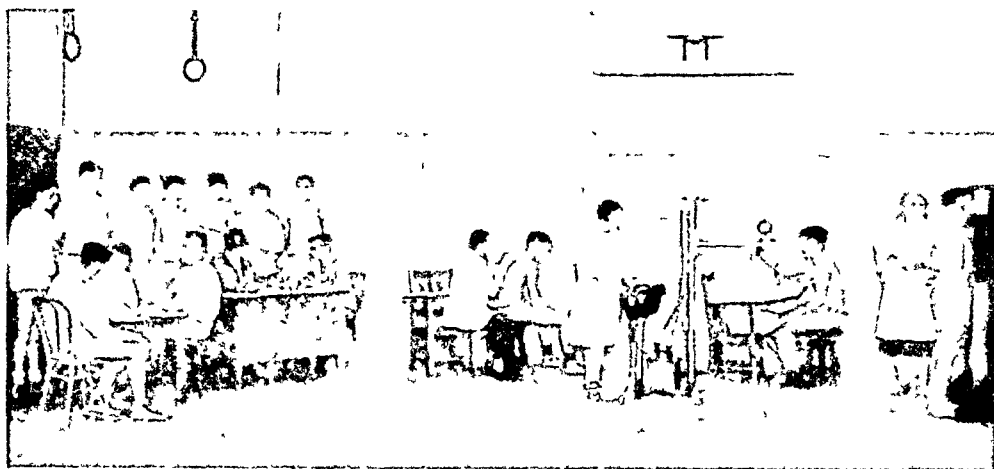


Figure 1—A temporary clinic set up in the gymnasium. Two physicians, one nurse, one x-ray technician and two clerks compose the examining staff. Notice the semi-portable fluoroscope.

The Nation-Wide Campaign for the Early Diagnosis of Tuberculosis

PHILIP P. JACOBS, PH.D., FELLOW A. P. H. A.

*Publicity Director, National Tuberculosis Association,
New York, N. Y.*

TWENTY years of campaigning up and down the length and breadth of the United States in the face of a rapidly declining death rate! Why is it necessary at this time to organize a nation-wide campaign for specific emphasis on early diagnosis of tuberculosis, such as is being planned by the national, state and local tuberculosis associations during March, 1928? Has not tuberculosis decreased to such a point that specific emphasis on this disease is unnecessary? Why not a campaign for health examinations instead of this special emphasis on tuberculosis?

To answer these questions, a certain amount of historical perspective is necessary. When the National Tuberculosis Association began its campaign for hospital provision for the tuberculous, following the Sixth International Congress on Tuberculosis in 1908, two types of institutions were projected: state sanatoria for early and incipient cases of tuberculosis, and hospitals of a local, county, municipal or district character for advanced cases.

Newsholme contended at the International Congress that the hospitalization of the advanced foci of infection had contributed most to the decline of the tuberculosis death rate. His thesis had much to do with the establishment of local and district hospitals. As time went on, however, these local institutions, as well as the state institutions, although legally of a decidedly differing character, were both compelled to admit all classes of cases.

The reasons for this change in practice in the face of the accepted theories of 1908, 1909 and 1910 are clear.

At this time interest in tuberculosis was confined to a handful of specialists; the rank and file of the profession was not well versed in the diagnosis of tuberculosis. Consequently, little discrimination was exercised in sending incipient and far advanced cases to the respective institutions provided for them. This failure to hospitalize the early cases has influenced sanatorium construction, and the "shack" that 25 years ago was designed for early cases exclusively, is now relatively unknown. Even at the present time, as recent studies have shown, less than 20 per cent of patients admitted to tuberculosis sanatoria are in the early stages of the disease. It is obvious that tuberculosis is not, in most instances, being discovered early.

Another evidence of the fact may be seen in the failure of physicians to report tuberculosis to the proper health authorities. As Plunkett has recently pointed out, with very few exceptions the state and local health authorities of this country have on record less than two cases on an average for every annual death. Since Armstrong's studies at Framingham indicated that nine active cases should be reported for every annual death, the records of living active cases will seem to be woefully inadequate. The reason for this incomplete reporting is found in the inability or the unwillingness of physicians to report tuberculosis until it has practically arrived at a fatal termination.

Still another reason for an early diagnosis campaign may be found in the experience of the national, state and local tuberculosis associations for the last ten or twelve years. The emphasis upon the child as a vital consideration in the prevention of tuberculosis, which began about fifteen years ago and has steadily increased in stress, had the inevitable effect on the tuberculosis campaign of broadening its scope and outlook. With tuberculosis conceived of as a childhood infection, developing into actual disease in early adult or middle life due to stress and strain and faulty personal and community hygiene, the campaign to prevent this disease has naturally become a broad public health movement. Thus the activities of many of the local and state tuberculosis associations have been dissipated upon comparative non-essentials in the tubercu-



Figure 11.—“Let Your Doctor Decide” is the slogan for the Early Diagnosis Campaign. The diagnosis of tuberculosis demands a skillful examination of the patients with bared chest.

losis movement, such as nutrition classes, vacation camps, sometimes wrongly called health camps, dilettante methods of health teaching both for children and adults, etc.

A year ago a committee of the national, state and local tuberculosis associations met in New York and decided, after some discussion, upon a plan for an annual national campaign of a strictly educational character. Some fifteen different subjects for such campaigns were considered and after careful elimination of one after the other, the early diagnosis of tuberculosis was decided upon for 1928, largely for the reasons herein enumerated. In planning the campaign, the Advisory Committee on Publicity and Publications, which had the matter in charge, wisely conceived of an organization comparable in scope to the well-known Christmas Seal Sales of recent years.

This campaign planned well in advance, has been under preparation for many months. In order to insure a nation-wide effect, rather than a spotty, scattered series of local endeavors, the national association has planned to distribute free to its affiliated associations over \$25,000 worth of posters and other forms of printed matter and educational matter, to give each state a nucleus for an educational movement. Additional literature will then be purchased by the states in accordance with their ability and interest. Every state, however, will have a supply

of material with which to work and a generous allotment has been allowed.

Through the courtesy of the Outdoor Advertising Association of America, it is anticipated that billboard space will be made available, ten thousand 24-sheet posters will be provided for that purpose. The design of this 24-sheet poster has been executed by F. G. Cooper, the famous letter artist whose food and thrift posters created so much interest during the war and post-war years. A small poster, designed by Ernest Hamlin Baker and drawn from life, depicts a typical scene of a physician in his office examining a patient. Both in color and technic this poster is said by those who have seen it to be the finest of its kind that has ever been produced. This design will be used as a poster (size 11 x 22 inches and 11 x 14 inches), and also as a central panel in a three-panel window display and as a small posterette (size 2 x 2 $\frac{3}{4}$ inches).

Two motion pictures are being prepared for the campaign. The first entitled "Delay is Dangerous" is a one-reel film designed for lay audiences and illustrates the importance of early diagnosis from the patient's point of view. The four danger signs on which particular stress is laid are those depicted on the 24-sheet poster; namely, too easily tired; loss of weight; indigestion and cough that hangs on.

In passing it may be said that all of the medical aspects of the campaign have been carefully passed upon by a special selected committee



Figure III—Young children are endangered by prolonged contact with tuberculosis in the home. Between the ages of ten and fourteen, the tracheo-bronchial glands are often found infected. Discovery of this condition, known also as hilum or juvenile tuberculosis, is the first step in preventing the serious adult type of the disease.

of the Board of Directors of the National Tuberculosis Association. This is to insure scientific accuracy of statement.

The film for physicians entitled "The Doctor Decides" is in two reels and is particularly designed to impress upon the physicians the importance and necessity as well as some of the technic of early diagnosis. The National Tuberculosis Association plans to make both of these films available at practically the cost of printing, in order to give them the widest possible distribution.

The organization of the campaign is through the state and local tuberculosis associations. The American Medical Association will give prominence to the campaign by articles and editorials in its journals. Several of the leading life insurance companies will actively coöperate.

Talks before the public and before special groups of nurses, social and health workers, will be an important feature of the campaign. Newspaper publicity and other methods of getting over the mesesage of the campaign will be employed.

A manual of publicity and suggestions for the conduct of the campaign will be available about January 1. Copies of this manual will be furnished to any health officer desiring it either by the office of the National Tuberculosis Association or through the office of the state tuberculosis association.

The support of the health officers and of the American Public Health Association in general is naturally anticipated. At the recent meeting of the American Public Health Association in Cincinnati, the interest of the Association was expressed in the adoption of a Resolution to give its assistance in every possible way.*

Health officers and others who are willing to participate in this early diagnosis campaign are urgently requested to get in touch with their state and local tuberculosis and health associations. This campaign offers an excellent opportunity to stress the reporting of tuberculosis and also the need for increased individual and community action.

Any of the supplies to be used in the campaign, including the printed matter and motion pictures may be secured through the affiliated tuberculosis associations. It is hoped that in coöperation with the tuberculosis associations, the health officers will avail themselves liberally of these supplies and will utilize them in every way possible.

By united effort, with intensive publicity concentration in the month of March, 1928, the danger signs of tuberculosis can best be presented to the public.

* Resolution No 6, adopted at the Fifty-sixth Annual Meeting of the American Public Health Association, October 17-21, 1927. *A. J. P. H.*, 17, 11.1163 (Nov.), 1927.

The Purification of Contaminated Oysters in Natural Waters

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RESULTS of a reinvestigation of the cleansing effect of changing sea water on contaminated oysters was reported in the March, 1926, issue of the JOURNAL. Two experiments were made—one in a tank, the other in natural waters.

The tank experiment showed that there was a very marked reduction in the number of *B. typhosus* on or in contaminated oysters after 3 changes of sea water. However, *B. typhosus* in small numbers could still be isolated after 18 changes of sea water covering a period of 24 days. This experiment was not wholly satisfactory for several reasons: First, apparently due to insufficient aeration, the oysters started to die after the 15th day and the experiment was terminated by the lack of further viable oysters. Second, although the temperature maintained was satisfactory for drinking, the volume of changing water was in no way comparable to the volume of change which tidal flow would give under natural conditions with resulting wash effect and dilution. These considerations made it seem that the rate of cleansing in tanks must be materially slower than in natural waters. We, therefore, looked for a place where contaminated oysters might be returned to their natural waters without creating a menace. The water was too cold at this time (December and January) to insure active drinking, but it seemed desirable while waiting for appropriate temperatures to determine the viability of *B. typhosus* on or in hibernating oysters.

Oysters, native to the waters to be used, were accordingly contaminated by drinking them in sea water to which feces containing *B. typhosus* had been added. The contamination was light. The oysters were returned to their waters. After 24 hours *B. typhosus* could not be isolated from the shells. The liquors became negative between the 10th and 17th days. Enrichments of the pooled gills were still positive on the 51st day, when the supply of oysters was exhausted. With the onset of warmer weather we repeated the above previously reported experiment.

Two lots of freshly dredged oysters were obtained. One lot came from the waters where the experiment was to be carried out, and the other from relatively distant waters. This inclusion was thought wise in view of the privilege given dealers to transfer oysters from doubtful sources to clean waters during the closed season. Each of these lots was divided into two batches and one batch of each lot was lightly contaminated and the other more heavily. They were then returned to the natural waters for test. The details of these experiments are given in the tabular summary. In addition to the actual temperatures of the water taken at the time of obtaining the samples the Weather Bureau report is also given as a further indication of the water temperature in the intervals.

TABLE I
MEAN TEMPERATURE FAHRENHEIT
MAY, 1926

8	9	10	11	12	13	14
62°	53°	56°	52°	58°	59°	62°
15	16	17	18	19	20	21
64°	53°	65°	71°	66°	60°	58°
22	23	24	25	26	27	28
58°	55°	52°	60°	60°	58°	56°
29	30	31				
60°	63°	60°				

JUNE, 1926

1	2	3	4	5	6	7	8	9	10
60°	78°	63°	62°	59°	63°	64°	72°	75°	76°

It will be seen from these temperatures that the conditions were such as to insure active drinking. This, with the dilution and wash of the tides, results in relatively quick cleansing as compared with the tank experiment or with the experiment in natural waters, at hibernating temperatures.

Reference to the tabular summary shows that the foreign oysters became negative bacteriologically between the 9th and 16th day, the native oysters between the 11th and 24th days. It should be noted that the last positive result was with oysters contaminated more heavily than would be likely under ordinary modes of pollution of oyster beds. The waters in which these experiments were carried out were near condemned oyster beds. A relatively large sewage content enters nearby waters, yet the area of water used yielded only 6 *B. coli*-like types per c.c. of which 4 were *B. aerogenes* and 2 were *B. coli*.

To complete the data in relation to this experiment it seemed desirable to retest the viability of *B. typhosus* in sea water utilizing the same methods of cultural enrichment. Six c.c. of a fecal suspension of feces containing *B. typhosus* was accordingly added to 3.25 liters of sea water. This was kept in the dark at a temperature of between 15° to 20° C.

TABLE II

RATE OF CLEANSING OF *B. TYPHOSUS* CONTAMINATED OYSTERS IN NATURAL WATERS
Foreign Oysters

Date	Days in Water	Temp. of Water	Light Contamination			Heavy Contamination		
			Shells	Liquors	Bodies	Shells	Liquors	Bodies
5- 8-26	0 (Controls)	51°F.	286 ²	25	0.6 ²	13800	786	61
5-11-26	2	50°F.	2	4	neg. <0.2	300	10	1.2
5-17-26	9	51°F.	neg. <0.1	neg. <0.01	neg. <0.01	neg. <0.1	neg. <0.01	0.01
5-19-26	11 ¹	58°F.						
5-25-26	16 ¹	54°F.	neg. <0.1	neg. <0.01	neg. <0.01	neg. <0.1	neg. <0.01	neg. <0.01
6- 2-26	24	59°F.						
6- 8-26	30	58°F.	neg. <0.1	neg. <0.01	neg. <0.01	neg. <0.1	neg. <0.01	neg. <0.01
6-10-26	32	60°F.						

Native Oysters

Date	Days in Water	Temp. of Water	Light Contamination			Heavy Contamination		
			Shells	Liquors	Bodies	Shells	Liquors	Bodies
5- 8-26	0 (Controls)	51°F.	430	48	0.8	19100	1170	58
5-11-26	2	50°F.						
5-17-26	9	51°F.						
5-19-26	11 ¹	58°F. . . . .	.. neg. <0.1	neg. <0.01	neg. <0.1	neg. <0.1	0.01	neg. <0.01
5-25-26	16 ¹	54°F.						
6- 2-26	24	59°F.	neg. <0.1	neg. <0.01	neg. <0.01	neg. <0.1	neg. <0.01	neg. <0.01
6- 8-26	30	58°F.						
6-10-26	32	60°F.	neg. <0.1	neg. <0.01	neg. <0.01	neg. <0.1	neg. <0.01	neg. <0.01

¹ Five oysters examined to 11th day, ten oysters from 16th day and later.² Quantitative estimates based on amount of fluid used to scrub shells, and total volume of body emulsified in broth.

NOTE—The gills were pooled in fives and incubated in brilliant green broth from the 11th day on. No positive results were obtained.

It will be noted that the mere addition of *B. typhosus* to sea water resulted in the death of nearly half the number. Although survival up to the 19th day was observed, this must be considered a practically maximum figure as the contamination was large and greater than occurs in the pollution of tidal waters.

In this connection it might be noted that in our previously reported experiment on the effect of changing sea water on oysters in a tank, we were able to isolate *B. typhosus* from the 16th change of sea water (21 days), but not from the 18th (24 days). These bacilli came largely from the sediment on the shells or bottom of the tank, possibly to a

TABLE III

SURVIVAL OF *B. TYPHOSUS* IN SEA WATEREstimated number of *B. Typhosus* Added to 1 c.c. of Sea Water Was 2446

Date	Days	<i>B. Typhosus</i> Per c.c.
6/16	0	1360
6/17	1	600
6/19	3	410
6/21	5	250
6/23	7	120
6/25	9	43
6/28	12	0.5
7/ 2	14	0.1
7/ 7	19	0.05
7/12	24	neg. <0.004
7/21	33	neg. <0.002

Remainder of sea water (approximately 2 liters) enriched, no *B. typhosus* isolated.

slighter extent from the inside of the oyster during drinking. These bacilli were probably in contact with sea water the major part of the time and the period of viability checks with the results of the experiment given above.

DISCUSSION

Within the limits of our bacteriological methods, we may summarize as follows:

B. typhosus may survive in oysters for at least from 9 to 11 days, but were not found in examinations made on the 16th and 24th days. This applies to oysters in their natural waters when the temperature is high enough to insure active drinking. *B. typhosus* may survive in sea water between 19 and 24 days. For purposes of discussion we might take the approximate means of these figures, 2 weeks for the oysters and 3 weeks for the sea water. How should these figures be interpreted in relation to determining the minimum time that should be required for oysters to remain in clean waters when transported from doubtful sources? Likewise, should such oysters have been contaminated with *B. typhosus*, what bearing has this on oysters in the beds to which they are transported?

The Health Department of New York City allows such transport during the closed season but no dredging of beds to which doubtful oysters are transported is allowed for 30 days thereafter. Is this a safe limit in terms of our experimental findings? Is a vicious cycle of events a tenable hypothesis?—contaminated oysters discharge *B. typhosus* into the sea water until about the 14th day, some remain viable for about 3 weeks and are able to recontaminate oysters where a number of the survivors may persist for 2 weeks, etc.

Obviously such an hypothesis of continuance of infectiousness ignores the following facts: The experimental oysters were initially more heavily contaminated than is likely to occur in tidal waters, the enormous dilution effect resulting from the tidal flow reducing to a minimum the possible quantitative recontamination, the rapid numerical decrease of *B. typhosus* through death and the lessened viability of the survivors due to lack of foodstuffs and the continued unfavorable action of the salt water.

The last *B. typhosus* were isolated from the liquor or bodies of the oysters where it might be presumed that they were protected to some degree by mucus from the full effect of the salinity of the water. All the facts available seem to indicate that the total length of time of contact with sea water was the determining factor and that contaminated oysters transferred to new water would require for purification a period

of time equivalent to the time of possible survival of *B. typhosus* in sea water or at least not appreciably more.

This further evidence of the possibility of the survival of a minimal number of *B. typhosus* in contaminated oysters even where drinking is presumably at its potential maximum deserves a comment in relation to the "drinking" of oysters in tanks of chlorinated water. The evidence again emphasizes the conclusion that however desirable, such a procedure may be from the standpoint of relative reduction of contamination should it unknowingly exist or of obtaining a safe water for conditioning or for wet storage; the relatively short drinking period cannot be considered a purification process in that it will surely render contaminated oysters safe for human consumption.

CONCLUSIONS

On the basis of the experimental data obtained it may be concluded that oysters contaminated with *B. typhosus*, when actively drinking in their natural habitat become non-infectious in 3 weeks. *B. typhosus* in sea water die in about the same period of time. An ordinance allowing the transfer of oysters from doubtful waters to clean waters during the closed season with the proviso that no dredging in the latter waters be allowed for a period of 4 weeks after the transfer, covers observed facts and gives a reasonably generous excess margin of safety.

Embree President of Rosenwald Fund

EDWIN ROGERS EMBREE, former vice-president of the Rockefeller Foundation, on January 1, 1928, became president of the Julius Rosenwald Fund and associate of Julius Rosenwald in his personal philanthropies, with headquarters in Chicago.

Mr. Embree, following a number of years as alumni secretary of Yale University, has been with the Rockefeller Foundation since 1917, serving successively as secretary, director of the Division of Studies and during the past year as vice-president. In addition to general administrative work he has been responsible for activities of the Foundation in hospital and dispensary service, nursing education, mental hygiene, and the development of the biological sciences. He has spent much time abroad in surveys and studies for the Foundation, visiting most of the nations of Europe, as well as Latin America and the countries of the Pacific, including the Orient, the Pacific Islands and Australasia.

The Julius Rosenwald Fund is the only large Foundation general in scope outside New York City. Its character, like that of the Rockefeller Foundation, limits its work only to "the well-being of mankind throughout the world." Mr. Rosenwald's giving has covered a wide field of interest in relief, education, health and welfare.

Present Status of School Hygiene in the United States^{*}

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THE YEAR 1927 has been one of stock-taking on the part of public health organizations, perhaps because it is the tenth year since the war. The war caused considerable agitation about health, and we find it easy to count by tens. Inventories are highly important for successful business, but good business methods are sadly lacking in much of our health work.

A general review of school health work as carried on in our forty-eight states is not an easy task. The result must be more or less impressionistic and this sketch does not pretend to be more.

STATE SUPERVISION

According to the formula of Herbert Spencer, evolution proceeds from the indefinite and incoherent to the definite and coherent. Taking the country as a whole we are still in a primitive condition as regards state-wide organization and administration of school health work. While there is advanced development in some quarters, there is, on the whole, considerable chaos. Where anything definite appears through the gloom, there are at least two visible shapes: The management of communicable diseases, delegated always to the state department of health, and physical education, whatever that may include, presided over almost exclusively by the state department of education.

When it comes to medical inspection and sanitation there is no such certainty as to what state authority should be in charge or whether anyone is in charge. This is due in large part to the changes which have come about as to the object of such work.

Medical Inspection—Medical inspection in our country began in a search for communicable disease. With the shift of emphasis, about 15 years ago, to the examination for defects, it became obvious that it

^{*} Read before the Child Hygiene Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 19, 1927.

would be better to move the local administration of such work over to the educational authorities, save in handling communicable diseases; and this has been largely done. The states have moved more slowly, and only 7 have placed the management of medical inspection under the state department of education, although in 26 states the medical inspection law must be administered locally by the boards of education. In 9 states the medical inspection law is to be administered by the state health authorities, in 11 it is administered jointly, and in the remaining states no authority is specified.

Forty-two states have some kind of a school medical inspection enactment. In only 16 states is the medical inspection law or regulation mandatory for the examination of pupils in all school districts; in 11 states it is permissive for all districts; in 7 there is no law; while in other states there shall or may be examination of teachers only, or for dental defects in pupils.

As regards the extent of the examination, 19 states command or imply a complete examination, 10 do not specify the extent of the examination, while in the others the teeth, or the sight and hearing, or the sight, hearing and teeth, or some other combination of functions or organs, are to be looked into. One is curious to know just what wisdom directed the varying choice in this matter. As to who shall examine, 23 states specify that they are to be persons of special training: physicians, nurses, physical directors, or dentists, or some combination of these, while 13 states include the teacher among the examiners.

Sanitation—As regards sanitation of schools, which is related to communicable diseases and has been especially so considered in times past when fumigation was in practice, it is to be expected that this work would be placed by enactment under the department of health, and so we find it in at least 12 states. In 6 it is under the supervision of the state department of education. In 12 there is joint responsibility, and according to replies to our inquiries there are a few states in which there is no one in charge. In at least 1 state there is a special school sanitation law, but the enforcement of this law is not delegated to anyone.

In practice, the sanitary condition of schools is usually taken care of locally, if at all, there being no one in either the state department of education or of health who takes it upon himself, or is particularly interested in studying the subject and endeavoring to keep school buildings and premises sanitary, and educational in these directions. There are exceptions, however: the state department of health of Connecticut recently completed a survey of water supplies. The department of health of Indiana made 92 sanitary surveys of schools last year, ordered

improvements in 68 cases, and prohibited the use of 24 buildings until sanitary conditions were remedied. The department of health of Kentucky has been making a survey in 40 counties. Possibly such surveys are made in other states, but we have not had the time to make a study of this subject in connection with this paper.

STATE AND LOCAL ORGANIZATIONS

There has been, we believe, no recent study of sanitary regulations, but at last accounts 12 states had no laws or regulations as to the provision of fire escapes or other means of fire protection for school buildings. More than half the states have regulations with regard to the provision of drinking fountains, but such fountains are often far from sanitary, while the water they supply may be from unsafe sources.

More than a fourth of the states had no legal provision for the supply of a privy, and in these states there are not only many schools without such a convenience, but, unfortunately, this occurs in some states which can least afford to be careless of human excreta. As an example of the turning over of a new leaf in the book of school sanitation, the revolution as to supply of toilets and their proper construction in North Carolina is most encouraging. A recent letter from the Director of Sanitary Engineering of North Carolina states that the installation of sanitary privies has been accomplished in all municipalities and villages. Unfortunately the law thus carried into effect is not state-wide as to rural schools.

The consolidation of schools has brought with it improvement in all sanitary arrangements and especially in sewage disposal. About one-third of the children from rural and village homes are, however, still in one-room schools. Consolidated schools are not without their drawbacks, and the question of heating and ventilation becomes of especial importance.

Half the states have specific laws regarding the ventilation of school buildings, and these laws seem to reflect an earnestness in the cause of health which is most creditable, for they entail much monetary outlay. Unfortunately they would now seem to have been of too specific a nature; but the legislator, who is presumably a practical man, has cause to question the fickleness of science, and he will want very good reason before revoking these ventilation laws.

The establishment of open air schools was an admission that ordinary classrooms are unhygienic. The reduction in the number of overheated rooms is a move toward better hygiene, but we ought to leave no question as to healthfulness.

There is general appreciation of and improvement in the lighting of

schoolrooms, and also in seats and seating, though we have far to go in some sections, for artificially lighted and poorly lighted schools are still to be found without much searching in our cities. No type of seat or desk really fits any child for very many minutes, but the fit ought to be better in a larger proportion of schools than it is.

If state-wide school sanitation is rarely satisfactory, neither is it so in some large cities with all their machinery for its promotion. In the sanitary survey of Philadelphia for 1924-25, 26 schools were classed as "poor," and ten as "bad," though this city is no exception. Nevertheless improvement is going on everywhere.

Physical Education and Health Teaching—Thirty-five states now have laws requiring physical education (which usually includes the teaching of hygiene). Although this is a prominent landmark amidst the confusion of administrative practices or allotment, even here there is in 5 states specification of participation by the department of health in control. In 10 states no organization is responsible for promotion of the school health educational program, and in 8 this great responsibility is shouldered on the department of health which is outside the school field and, besides, more than has its hands full with other activities.

ORGANIZATION IN STATE DEPARTMENTS

It is encouraging to find 15 states showing sufficient interest in the subject of school health (aside from medical inspection) to make someone responsible for getting this work under way and keeping it going. Fortunately, these states comprise half the school population of the country so that the general picture is better than mere numbers of states would suggest. There is, however, little evidence in most quarters that the promotion of health is considered in practice, with nearly the concern with which it is regarded in theory. In fact, in at least 3 states, although the law establishes the position of state director of health and physical education, no funds are appropriated to fill the position.

From this necessarily blurred picture of the general conditions as to state organization and regulation of school health work one must expect much dissatisfaction among state officials, and this is almost universal.

In a few instances, very good work is being done under the direction of state departments of education, departments of health, or with joint supervision. It all depends on personnel, coöperation, and available funds, although it would seem that the personnel for this work could be most advantageously installed in the office of the department of education.

That state supervision of medical inspection produces quantitative

results is evident if we can trust statistics: Pennsylvania claims the examination of 98 per cent of pupils enrolled; New Hampshire "practically all"; Virginia 91 per cent; New York about 80 per cent. Possibly some other states do as well, but we have no records and for most of them the number examined in rural schools must be very few indeed.

LOCAL SCHOOL HEALTH WORK

With the diversity in laws and of active interest and positive stimulation and guidance of health work existing in state departments, we may expect to find all degrees of excellence of work carried on locally, and much mediocrity or even absence of work. Since this latter condition of affairs exists in some localities where there are excellent state laws, state supervisors, and a genuine interest in health promotion, we can expect very little progress where there is nothing of the sort.

So far as the finding of defects is concerned, medical examiners have, since the time of Cohn, been most interested in the matter of vision; yet from an estimate of the Joint Committee on Health Problems in Education not half of the school children of the United States have ever had their eyes examined. This signifies that in not more than half the schoolrooms of the country has any attempt at medical inspection been made, and yet we are still talking of how very much shocked we were over "the revelations of the draft."

Information received by the Bureau of Education is fairly definite regarding larger cities, but becomes hazy as we approach the smaller cities, partly from lack of replies to inquiries and partly from indefiniteness of the answers. Judging in a general way from these returns, in most states there is practically no medical inspection worth the name in communities having a population of less than 10,000. There are plenty of exceptions in some states, but this can be considered the rule. The forces interested in health work are weak in smaller communities and the boards of education move along conventional lines. Even in cities of between 10,000 and 30,000 population, only about two-thirds report the employment of a school physician.

A large proportion of school physicians are on part-time, which may be advisable for assistants, but not usually for the physician in charge. Their pay ranges from \$.42 to \$4.00 an hour, and it is safe to say that in most cases the school gets no better service than it pays for.

A nurse is employed by practically all cities of over 30,000 population and there is an average of 2 nurses to 1 medical school officer and about 1 nurse per 3,000 children. Three-fourths of the cities from 10,000 to 30,000 employ nurses, and these average the same number as physicians.

An annual examination of pupils is attempted by about 50 or 60 per cent of these cities, the examinations being made to an increasing extent, in part, at least, by teachers and nurses and in most instances there is a physician to check up the findings of other examiners.

In communities under 10,000, and particularly those under 2,500 population, there is a decided falling off in physical examinations, and, except for certain states which stand out as exceptions, there is very little of such practice in villages and in rural schools; in other words, for half the school population of the country. In the notable exceptions, there is a mandatory law, for the carrying out of which a state department is made responsible.

Health work in rural schools, along all lines, halts because of lack of adequate district or county organization for both education and public health and lack of close coöperation between such organizations.

QUALITY OF MEDICAL INSPECTION AND RESULTS

Medical inspectors have been engaged too much in the tedious business of finding any or all defects regardless of whether these really needed correction or were even correctable. It is needless to say that few medical inspectors have had any special training for their work, and the lack of research by American workers in this field is appalling. The remark of Dr. James Kerr that "medical inspection of school children ought to have added enormously to our knowledge, if it had been scientifically organized," is doubly true in our own country. But it is largely a matter of recompense. The physician who determines vision only by the Snellen card, uses the same tongue depressor on all children, and reports all large tonsils as defects, is what we may expect to get for our money.

An improvement is slowly coming about, in that information about children is being secured from those who know them most intimately and in a working capacity. Parents and teachers are given grudgingly to some extent the place they deserve in the scheme of child study. The teacher is expected to show an interest if Johnny Jones cuts his finger, but it is more essential that she, above all persons, observe whether the said Johnny can see his letters, or hear her voice. The parents must some time learn about defects, and why not first-hand when they can be helpful in determining whether a defect is really worth correcting? We are more likely to get defects corrected if we present the need directly instead of beating about the bush with notes from principals or with expensive visitations from the school nurse. There are practically no school physicians or nurses for half the school children of the country; but there are teachers for all of these, who, with comparatively little

training, make as good examinations as the average school medical inspector, and they are in a more strategic position for doing so. In either case the final diagnosis is made by the family physician or dentist. The hope for physical examinations for half of our children and for better examinations of the other half lies in a right training of these teachers. I speak from experience in the training both of medical students and of teachers.

Removal of Defects—We have not, on the whole, passed out of the stage of the mere finding of defects, for according to a report from one school district employing a physician, 60 per cent of the children were found defective, and but 2 per cent were treated, while in another district of the same state 85 per cent were reported defective and 80 per cent corrected.

As examples of average results, we have the state-wide figures from New York (1923–24) showing 62 per cent defective and 44 per cent corrected. In Pennsylvania 1924–25 the figures are much the same.

Such statistics are often misleading, as the percentage of corrections is determined in part by the nature of the defects included, and the mere treatment may not mean adequate treatment. This all proves the need for better personnel and a knowledge of the essentials in defects and in their correction.

Taking the results at their face value, it is interesting to note that, although the number of defects reported in the city and rural schools is practically the same (1,000 per 1,000 children) the percentage of defects "corrected" in rural schools is just about half that in city schools.

Granted that the defects can be corrected and are worth correcting (and they should not be reported unless they are) it is a waste of time and money if after finding them they are not treated.

A review of the reports of the Division of Medical Inspection in Philadelphia for the past 10 years shows a remarkable uniformity in the proportion of physical defects corrected, which runs about 46 per cent for the more important defects or 55 per cent for all. In contrast, it is illuminating, however, to read that "remarkable results were secured at the Philadelphia Normal School where 96.3 per cent (double that for elementary schools) of all physical defects recommended for treatment were corrected," and the only persuasive factor not existing in the elementary schools is a regulation that all defects must be corrected "if the student is to continue as a teacher-training candidate."

Practically 100 per cent corrections are also secured in Connecticut by a similar edict of the state department of education as regards students entering its teacher-training schools.

We are always working from the top and perhaps in the course of a

half century we will make it a regulation that the child whom we compel to undergo the process of education shall be put and kept in condition to profit by that process.

However, where health is not considered an incidental matter by principal and teachers, really thorough work can be done and is done, and we have reports from a few school districts of corrections which reach near 100 per cent and, for some defects attain it. In 9 schools of one rural district all of the 1700 pupils had their dental defects corrected, and in at least one junior high school the principal has dared to lay down the law that no pupil shall be graduated who has not had his teeth placed in 100 per cent repair. If such a ruling could be extended to cover all defects, medical inspection would be placed on something better than a dilettante and sentimental foundation; there would arise a serious interest in the subject of what constitutes a remediable defect; and there would be a scurrying about to find medical examiners worthy of their tasks.

Dental Work—As regards dental defects which figure so largely in the general total, the medical examiner has been reporting only about 40 per cent of elementary children as having such defects when actually 90 to 95 per cent have an average of 7 carious teeth. One reason for poor results in treatment of these defects has been that the medical inspector has found only advanced conditions chiefly in temporary teeth, the majority of which could not be really corrected if worth correcting.

With the possibilities in prophylaxis developed through the work of the Forsyth Dental Infirmary it would seem that the chapter of dental work which dealt chiefly with rotting teeth can be closed, though it may take some time to open the new one in which these infinitely the most common of defects will be adequately dealt with. No matter however whether we anticipate, or wait for, decay dental defects should be dealt with at the earliest possible moment, and the examination for such conditions should be made by the dentist, dental hygienist or someone who knows the signs of beginning decay. We believe it is only a matter of time when the dental hygienist will be trained to do early fillings, the dentist being reserved for the more difficult and elaborate activities of his profession. In that advanced country, New Zealand, the routine work of the school dentist is done by such an assistant, and it would seem that most of such work could safely and economically be placed in her hands. Even by the older methods, where there is real interest in the matter, 100 per cent of corrections have been secured in some of our schools, and abroad, a thorough program has been carried out in at least one city at a surprisingly low cost and with the result that 90 per cent of the children now leave school with sound teeth.

Nutrition Work—Weighing and measuring of children has recently been a feature of school work hinging on the one side with medical inspection, and on the other leading to the interesting of pupils in habits conducive to health. Unfortunately it has been dragged too much into the strong current of standardizing which has swept the country and the use of tape and scales has been too exclusively associated with classification according to deviation below or above certain arbitrary standards. This, in turn, has given emphasis to quantity rather than quality in nutrition. The mere fact that a child does not weigh a certain number of pounds (even the lack of one pound may label him underweight) does not at all signify that he is not so well fed as a child who does weigh that number of pounds. Nutrition classes based on relative weights still exist, though we are of the opinion that their number is diminishing; but there is, fortunately, an effort to have all children better cared for at home. The noon lunch too, whether in city or rural schools, is vastly improved in materials and methods of service all over the country.

On the side of medical work, the tape and scales have been used as means of sorting children for special preventive measures against tuberculosis; those falling into a certain percentile group being considered "threatened" with this disease, to use a very convenient phrase. The studies of Morse, McDougal, Reisman, and others have quite upset this theory, and Hill has furnished ample proof that relative weight has nothing to do with the incidence of any of the common infections of childhood.

HEALTH EDUCATION

We have had 10 years of the new hygiene or "health education" as it is called.

In 15 states there is a state director of physical education in charge, and in at least 2 of these a specially designated supervisor of health teaching. In these states such work goes much better than in others, though the existence of a state official cannot make up for lack of teacher-training or of local supervision and direction.

Local Supervision—From the beginning of this work the teachers were not prepared by their training, and what they are not specifically prepared for they seldom do without direct supervision. Even with the large turn-over in teachers, the percentage so prepared must still be small in most sections of the country. It is probably safe to say that in three-fourths of the cities of all sizes health education of the new order is conducted to some extent in elementary schools. A special directing health teacher is employed in about 10 per cent of cities over 30,000 and in 5 per cent of smaller cities.

In rural schools with an enrollment of 10,000,000 children we find little or no such teaching, with many contrasting spots, however, where there is excellent district or county supervision by a special hygienist or thoroughly prepared teacher. In some of the western states where county superintendents are awake to the importance of health, there is even a demand for well prepared health supervisors which cannot be adequately filled.

It all depends on the local education authorities and we cannot expect these to be made over in a day, or to be more than local demand calls for and pays for. Many of these, when the matter of health work is inquired into, are likely to state that they have no funds, or no special teachers, neither of which are needed for doing excellent work along these lines.

The time devoted to teaching of health in elementary schools varies from zero up to 160 minutes per week, with an average of about 60 minutes.

Content and Methods in Health Teaching—Besides our failure to recognize the predominant rôle of the home and of parents in the scheme of health teaching, our efforts have suffered again from the current tendency to try to standardize the human being. This has resulted in setting down exact measures as to the amount of milk or water every child shall drink, how many hours he shall sleep, the number of his bowel movements per day and other rules equally absurd. Our teaching has also been upset by the weather-cockishness of science which in one season says the use of the tooth brush preserves the teeth, and in another says it does nothing of the sort; which makes much one year of calories and in another sees our salvation in vitamins; which talks one season of poisonous air, and in the next says that only over-heated air is injurious.

HEALTH TEACHING IN HIGH SCHOOLS AND COLLEGES

High schools, struggling under the load of college requirements, find scant time for anything of so intimately human importance as hygiene, and recent information received by the Bureau of Education shows that in not more than 25 per cent is any definite time set apart for class work in this subject, and we are not at all certain that even in these schools it is taught to all pupils. One school admits that this subject is taught only to girls. When taught, the time devoted to the subject varies from 15 to 225 minutes a week.

Nor do the colleges take the matter of health as seriously as we would expect. One of the oldest and most influential offers a course of only 3 lectures in hygiene as a preparation for the "art of keeping alive

and well," although 50 years ago 24 lectures were given to all students.

There is always the danger of running to the other extreme by over-doing such teaching and making the pupil tired of hearing about health and sick of trying to practice the laws of health. The subject is indeed a difficult one to handle wisely, and in our professional ardor we need to avoid its over-doing.

PHYSICAL EDUCATION

Taking physical education in the Spencerian sense, it includes all school health work, and in the special realm of the direction of physical activities of playground and gymnasium it attempts to minister to one of the primal needs of the child which makes for physical and mental health.

The director of physical activities is among the best paid of our specialists, a fact which speaks much for the recognition of this work. It found its way into the curriculum under the form of classroom gymnastic exercises intended as a means of counteracting the recognized unhealthful conditions of school existence. The 15 to 30 minutes a day (or the two periods a week) usually devoted to such work is absurdly small, unless it be considered only as a time of instruction in activities to be practiced elsewhere.

So long as past conceptions of education hold sway, it is not likely that further time for physical activities will be allowed in school hours, but opportunity for the practice of these should be furnished elsewhere.

Schools, particularly high schools, have been going to extravagant expense for coaches, paraphernalia, etc., for the few who participate in inter-school sports, and it is but logical that they should do as much for the rank and file. Adequate space and adequate supervision for the physical activities of all children for at least 2 hours every day of the week would seem to be a minimum need in every community. Very few can boast of this offering.

CONDITIONS TO BE MET

It is easy for us to sit in our offices and arrange school health programs and say they should go thus and so. But our plans often meet with difficulties in the mental attitudes of educators, school boards and communities at large, hanging over from medieval if not from primeval times. However, very few discouraging or discouraged remarks come from communities over 2500 population, and even in rural communities there is an appreciation of the importance of the health program reported by many superintendents.

No review of school health work is complete without consideration of the coöperation of the home, for, while other school matters may be

handled without help from parents, it is quite otherwise with the physical improvement of the child. We have overlooked this fact altogether in the past, but we are rapidly making amends. In the meanwhile the Parent Teacher Association has become our most helpful ally. I do not need to emphasize its importance.

Promotion and supervision of school health work by voluntary agencies, such as the tuberculosis association or Red Cross, exists statewide or locally in some sections of the country. While this seems a primitive condition, when we consider the theoretical interest in health exhibited by the educational world, it is better than no work, and leads in time, if wisely conducted, to the development of such work under the appropriate agencies.

The organizations especially interested in the hard-of-hearing, in the crippled child, and in the child with poor vision, have done excellent work in promoting special facilities for their education in city and to some extent in rural communities. Such work is progressing favorably.

The American Child Health Association remains a powerful agent in the stimulation of all forms of school health work, and we are all interested in the attempt at evaluating the actual value of our present practices which it has undertaken.

Among the very hopeful signs of the times is the great progress made in school health work along all lines in parochial schools. This activity is being stimulated and directed through the Bureau of the National Catholic Welfare Conference, and health education courses for teachers have already been introduced in some of the Catholic universities.

PRESCHOOL EXAMINATIONS

Among the recent developments we must mention the attempts made by various agencies to secure the physical examination and treatment of children prior to entrance to school. This is a laudable undertaking, but does not replace school medical inspection. The preschool child cannot be satisfactorily examined as to certain defects, and, besides, after entrance to school he retains many of those he had, and often adds new ones. Although children are examined every year in Philadelphia and 50 per cent of defects are reported as "corrected," the total number of defects reported in 1925 were: for elementary, 1050 per 1000 pupils; for junior high and trade schools, 837; for senior high schools, 800; and for normal schools, 1063. Seemingly at graduation from high school the student, although examined every year, with about 50 per cent of his defects corrected, has as many defects as in the beginning of his school career. If we omit dental defects, substitute the word "treated" for corrected, and remember that communicable dis-

eases, like the poor, we have with us always, these figures are not so discouraging as they seem.

SUMMARY

Considering the inertia of pedagogical tradition and the heavy weight of family custom and personal prejudice which must be overcome, we are really making rapid progress along all lines of school health work, and the few mistakes, due chiefly to the shifting sands of science and our current obsession for standardizing, have not thrown us much out of our course or caused us much regret.

There are a few points which seem to stand out as especially obstructive to progress. Our legislators have been quite generous toward school health work, but many of our laws would be more helpful if less specific as to details and more definite as to enforcement. There is need of integration, organization and competent direction of all school health work in state departments and locally. There is need of closer understanding and coöperation between health and educational authorities.

Medical inspection needs to be placed on a more businesslike basis, both as to examinations and treatments. Dental inspection should be completely divorced from other work and conducted by dentists or dental hygienists. Adequate teacher-training in health examinations and health teaching are of great importance and are not as yet fully met. There is need for the development of ample facilities for, and direction of, physical activities out of school hours. We have much to learn in regard to school sanitation, and there is still the troublesome problem of communicable diseases and of malnutrition, which together are prominent factors in practically all of the defects and diseases of school children. Immunization against communicable diseases must be carried out as far as possible. The home must be hitched up with the school in interest and knowledge of child health if we are to get very far.

After all, however, the child arrives at school at a comparatively advanced stage of development and already possessed of most of the physical defects he will have during all his school days. The school cannot undo what has been done. We need to begin much earlier than the school period to advance the physical and mental welfare of the race, but by whole-hearted understanding and coöperation of educators, hygienists, and the home we can accomplish much.

Ambition and desire are fundamental to the search for health, as for the attainment of any other end, and in the period of school life we can perhaps accomplish most along lines now most neglected; namely, by endeavoring to arouse in high school and college students the desire and ambition for the improvement of the generation that is to be.

DISCUSSION

GEORGE TRUMAN PALMER, DR. P.H., FELLOW A. P. H. A.

Director of Research, American Child Health Association, New York, N. Y.

DR. ROGERS'S PAPER gives us a very clear presentation of the school hygiene situation in this country. We have popular interest in health. We have recognition of the importance of health on the part of educational authorities. We have laws. At least 42 states have acknowledged by statute the desirability of school medical inspection. These are indications of growth and progress.

There is an aspect of this work however which is almost totally undeveloped, and that is the measurement of results. We do not know the degree to which the object of this work, the school child, has profited from all this effort. Has not the time approached when we should seriously tackle the job of checking results?

The business man is accustomed to the taking of an inventory. He wants to know not only how much goods have been sold but what has been the net return in dollars and cents. The aviator wants to know not only how many miles he has travelled and the quantity of gas consumed, but also whether he is keeping to his course. In school health work we ought to know not only how many examinations or nursing visits are made but how much the level of health has been raised as a result of the specific measures used to accomplish this end.

There are at least three rather distinct purposes of school health work: First, there is the protection of the child against the hazards of school life. Education is compulsory, and therefore it would appear only fair to fathers and mothers that the educator should give assurance that every precaution will be taken to prevent attendance at school from endangering health. It is this thought which justifies sanitation of the school plant, watchfulness against the spread of communicable disease, and immunization against such diseases as is practicable. The second objective is the protection of the school investment, by making certain that the pupils for whom educational expenditures are made are in a fit physical condition to receive instruction efficiently. It is this fact that justifies physical examinations and nursing service. A third objective is part and parcel of education, the building of a better informed and more virile citizenry. It is this purpose which justifies health education and physical education.

To measure progress toward the first objective there is needed at least a more precise knowledge of the causes of absence distinguishing between those causes related to health from those not so related. Absence might well be recorded under five distinct headings: A, colds and their complications; B, the specific communicable diseases of childhood such as scarlet fever, measles, diphtheria, etc.; C, other ills and injuries; D, exclusion not because of illness, but because of exposure to others with recognized transmissible diseases; E, causes other than illness or exclusion, such as staying at home through fear of epidemics, visits to relatives, etc.

Measuring the second point involves the development of reliable objective methods for gauging the status of different aspects of physical condition, such as vision, nutrition, hearing, teeth, etc. We have standard methods of water analysis; we need commonly accepted standards for expressing results of school health work.

Let me digress for a moment here to say that in speaking of standards of measurement, I do not mean to imply that children should be standardized or that health programs should be standardized. Mention of the word standardization frequently

provokes an unfavorable reaction. In measuring results, however, there must be objectivity, and this means standardization in terminology and in technic—otherwise comparisons are impossible.

It is the lack of such standards that renders existing reports on physical defects and corrections valueless for comparison. One city reports 10 per cent of children possessing a certain defect. Another city reports 30 per cent. In one place vision is called defective if the 20/20 line cannot be read. In another place a defect is not recorded unless the 20/30 line is not read. Until a defect is defined in precise terms and the manner of determining that defect reduced to standard routine, the resulting figures do not show real differences in the distribution of physical handicaps among children. This type of measurement though difficult is not insurmountable.

The third objective can perhaps best be checked by tests of knowledge, habits, attitudes as well as of strength and physical prowess. Such tests of course tell only part of the story because the lasting success of health and physical education will not be known until school days have long been passed.

It is with the object of contributing to this field of measurement in school hygiene, that the American Child Health Association has recently embarked on an intensive study. Their efforts are directed toward portions of the second and third objectives, the measurement of different aspects of health status and of health knowledge, habits and attitudes.

For a year and a half research has been conducted with children and with examiners in the effort to secure objective, reliable and valid measures. The same children have been repeatedly tested by different people, each working independently. Gradually there have evolved methods proved by actual trial, which will give the same result in the hands of different examiners, which will give the same result a week from today as today, providing the object being examined does not change, and which assure a measure of the thing that it is desired to measure.

In the development of the plan of this research and in the development of the original technic used, the greatest contributor has been Raymond Franzen, Ph.D., a man of wide experience in the field of educational measurement. He has been assisted by physicians, teachers, nurses, dentists, public health workers and others.

Equipped with these testing procedures, the A. C. H. A. has just dispatched three squads of technicians, five members on a squad, to make observations upon from 8,000 to 10,000 fifth and sixth grade children scattered over 70 cities of the country. This will continue during the present school year.

It is the ambition of the association to derive from this experience: First, a knowledge of the differences in certain aspects of health in children, and consequently a better understanding of school health problems. Second, a knowledge of the degree to which certain aspects of health are associated with certain school health activities. Third, a means whereby school authorities can judge progress in health promoting activities. Fourth, information which will be of assistance in laying out a more productive and resultful health program in the schools.

If some of the hopes of the association can be realized from this study, it should be possible for school administrators to discriminate more wisely in the choice of school health activities, to eliminate the unproductive, and cultivate more assiduously the steps that count.

NOTE: The discussion by Harold DeWitt Cross, D.M.D., will appear in the February JOURNAL as a separate article, entitled "Dental Hygiene Aspects of the School Health Problem."

EDITORIAL SECTION

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THE NEW JOURNAL

WITH this, the first number of its eighteenth year, we present to our readers a new AMERICAN JOURNAL OF PUBLIC HEALTH. In doing so, we are taking an important step in the forward looking program which the American Public Health Association has adopted with respect to its publication activities. The JOURNAL comes to you in a cover of livelier hue and with a new dress of type notable for its beauty and legibility. It is printed on a fine grade of book paper. It is a sewn book, easy to open, easy to hold. It is indeed a new JOURNAL in appearance. But as to well written, soundly scientific text content it is the old JOURNAL. We shall keep the standard as high as ever and exert every effort to raise it.

In this new JOURNAL is incorporated for the first time another periodical, a publication which has made a place for itself in the public health field under notable editorship recently and in the past and always with fine publishing ideals. The American Public Health Association has acquired *The Nation's Health* from the Modern Hospital Publishing Company of Chicago. With this issue, *The Nation's Health* is merged with the AMERICAN JOURNAL OF PUBLIC HEALTH. The names of both will appear on our cover and title pages. The most noteworthy features of both will continue each month.

We welcome to our pages the thousands of readers of *The Nation's Health*. We welcome its advertisers who thereby gain a larger audience and one that completely represents the public health field. We go forward with our banners high and remembering always the words on the Association seal: "And the leaves of the tree were for the healing of the nation."

THE DISMISSAL OF DR. HERMAN N. BUNDESEN

IT HAS BEEN a long time since anything has occurred which has so shocked the public health officers of the United States, or done so much to upset the morale of those engaged in health work, as the dismissal of Dr. Herman N. Bundesen as Health Commissioner of Chicago. Some suspected that this would occur soon after the election of Mayor Thompson, but as the months went by, everyone felt that he had recognized the fitness of things by retaining a health officer who has been distinguished by his beneficent activities. We know of no charges which have been made against him. On the other hand, we know that he has received the highest commendation from the best class of physicians in Chicago, and in addition, has been the recipient of a number of distinguished honors, such as the Lawson prize, which was given on account of his good work in saving the lives of infants and insistence on clean milk, and an honorary degree by his alma mater conferred largely because of his record as a health officer. He was also elected President of the American Public Health Association.

We know further that he has surrounded himself by a group of unusually efficient men; that every department in his office was headed by an expert; and that the entire health department of Chicago has been a model in organization as well as accomplishment.

The value of experience has apparently been thrown to the winds. The new appointee has been a resident of Chicago only since 1922. There is no evidence that he has ever had any training in public health work, and the only experience of this kind which is noted is that he was appointed by the mayor as Chairman of the Medical Section of the Chicago Flood Control Conference. While we wish him every success, it is perfectly evident that he lacks public health training as well as experience, and we judge of this by what purports to be an official document concerning him. His entire training, apart from that which the usual medical student gets, seems to have been in surgery, and he is spoken of as a "surgeon and surgical consultant."

In this connection, we wish to point out that the medical degree does not of itself fit anyone to be a health officer. It requires special training and a certain amount of experience, for which we believe the medical degree is a great assistance, but which is very far from making one proficient in public health work.

This JOURNAL has always stood, and we hope always will stand, for tenure of office, so that a competent health officer and his assistants may be assured of permanency. Politics is the most baneful influence to which public health work in this country is subject at the present time. It has been responsible for disasters in the past, and we believe

is still the chief cause of many of the shortcomings which those interested in public health work recognize.

While the new health officer has, according to the newspapers, denied that he expects to discharge any of the personnel at present in the department, he has also said that if the mayor wished to appoint any friends, he would try to coöperate.

We hope that nothing we have said will be considered personal. It is not intended to be so, but unquestionably a most deplorable situation has come about, and no one on the outside knows what to expect.

Chicago is one of our largest and most important cities, and what happens in health matters there deeply concerns the entire United States.

This JOURNAL is interested in building up public health as a profession, and every such occurrence sets back the good work which has been going on for a number of years.

THE BAD MILK IN OUR SMALL TOWNS

STARTLING and shocking are the facts revealed by a recent survey of market milk in the small towns of the United States. In our towns and cities having populations of less than 25,000 the milk seems as a general rule to be dirty and contaminated. According to a report of the American Child Health Association,¹ which has coöperated in investigations in 19 states, the milk supplies of small towns are high in bacteria, seldom come from tuberculin tested cattle, and are rarely pasteurized.

In 117 small towns and cities studied, an average of 25 per cent of the milk supplies examined contained 200,000 or more bacteria per c.c., while an average of 40 per cent had 100,000 or more bacteria. Fifty-one cities gave a positive test for *B. Coli* in 50 per cent or more of the supplies tested and 21 cities gave such a positive test in 75 per cent or more. Physical standards used for showing dirt revealed that most of the milk was actually dirty. In only two places could 75 per cent of the supplies be classed as "clean" or even "fairly clean."

Not one of the 117 towns and cities had 90 per cent pasteurization, and 97 of these communities had no pasteurization at all. These facts are in direct contrast to the large cities of the country, as more than half of the cities with a population of 100,000 or greater now have 90 per cent or more of their milk supplies pasteurized.

These significant facts call for strenuous efforts on the part of sanitarians to assure a better and purer supply of the best of foods of man.

Campaigns to induce people to drink milk are valuable, because good milk is the one nearly perfect nutriment, but along with these cam-

paigns must go assiduous endeavors to secure clean and safe milk. There are apparently many parts of the country where it is wiser to use some concentrated form of milk, such as the dried product, than the extremely dangerous fluid milk supply. The milk furnished in our large cities, at least that supplied by the more reputable companies, may be drunk with impunity, but until more adequate and intensive methods have been taken to improve the milk supplies of small towns, their use as a beverage is evidently fraught with some hazards.

¹ Crumbine, S. J. and Holland, D. F. Survey of Small Town Milk Supplies, *Child Health Bulletin*, Nov., 1927.

SANITATION OF WATERWAYS

THE newly constituted Board of Public Health Engineers of the Ohio River Basin* is believed to be the first board of its kind in this country. Its creation points clearly to further improvement in the sanitation of our waterways.

Our methods of attacking the stream pollution problem are varied, to say the least. Some consider coöperation with industry as the solution; others maintain that the results of research will prove to be the explanation; while a third group adheres closely to strictly regulatory measures. It would seem that the combining of all three of these courses in such balance as to be applicable to the needs in each separate instance would be the best procedure.

From the administrative standpoint, authority for control has been lodged in some cases in a single regulatory body such as a state health department, and in others, in a new group like the Pennsylvania Sanitary Water Board having diversified interests. However, the general tendency appears to be toward the formation in states of such boards or committees as will include within themselves all the different interests concerned in the purity of the waters. The policies of these administrative bodies differ. Some set up rigid control to abate or, at least, diminish all pollution; some, under a plan of stream classification, propose that certain waterways should be devoted to the reception of wastes, while other streams should be maintained in their present state of purity.

The trend in waterways sanitation in this country resembles that in England which has had a hundred or more years of experience with this question. The chemist¹ of the West Riding Rivers Board has pointed out that in England there has been an improvement in the waterways of the older industrial areas due to remedial measures. On the other hand, he indicates that in the newer areas conditions are

* See page 104.

becoming worse on account of the increase in the amount of sewage and industrial wastes. His proposals for the improvement of stream conditions are: (1) the survey and classification of streams and watershed areas, and (2) the formation of additional rivers boards. He also suggests that liquid trade wastes be admitted to public sewers and that increased research in fundamental problems of stream pollution and sewage treatment be provided.

Apparently waterways sanitation has lagged in England also, because of divided authority. Lord Mildmay of Flete¹ points out "how the problems of pollution have constantly engaged the attention of Royal Commissions, of Select and Departmental Committees, of scientific bodies and of other institutions, for more than half a century and how all have agreed that some form of central authority is absolutely necessary in view of the lack of coördination which exists amongst those bodies that have control of rivers—lack of coördination which has resulted in confusion and indifference."

In reply the Lord President of the Council, the Earl of Balfour, stated that there were two problems to be considered; namely, an administrative one and a scientific one. He advised the House of Lords that, to cope with the first, the government had appointed an advisory committee representing the departments concerned and having as chairman Sir Horace Monro and, to handle the second, a board,* with Dr. H. T. Calvert, M.B.E. as chairman.

From the foregoing comparison, it appears that, in many ways, practices related to administrative and scientific attack of the stream pollution problem in England and in this country are more and more approaching parallel lines. This division of the regulatory and research problem would seem to be a wise example to follow in this country.

*From the context of the unrevised report it appears that this group is called the Water Pollution Research Board.

REFERENCES

¹ *Surveyor*, Vol. 72, July 22, 1927

² *Parliamentary Debates*, House of Lords, Monday, July 18, 1927, 68, 58:602.

BACK TO BEGINNINGS

THE National Tuberculosis Association has taken a wise step in the inauguration of a country-wide early diagnosis campaign, as outlined elsewhere in these pages.

The hope of cure in tuberculosis depends upon the early discovery of the disease. There is abundant evidence, both from clinical observation and the post-mortem table, that of all the chronic diseases, tuberculosis is probably the most easily healed. Many authorities

agree that if the disease is discovered in its incipency, or in its "minimal stage," to use a more scientific term, as high as 85 per cent of those placed under proper treatment will be restored to working efficiency.

But while these truths have been vigorously proclaimed for twenty years or more, there still seems to be an apathy, both on the part of the public and the medical profession, to the significance of the early recognition of tuberculosis. The disease is so insidious in its beginnings and resembles in its minimal stages so many pathological conditions other than tuberculosis, that detection before serious lesions have resulted in the lungs is extremely difficult.

Study of early cases on record in sanatoria for the treatment of the disease and in the files of health departments, indicate a need for concentrated effort along the lines proposed by the national, state and local tuberculosis associations to be carried on during next March. Less than 20 per cent of the pulmonary cases which go to the average tuberculosis sanatorium are in the real early, curable stages of the disease.

Plunkett's study of tuberculosis reporting shows that almost one-half (44.7 per cent) of the cases which terminated in the death of the patient were either not reported at all (14.1 per cent) or were reported after death (30.6 per cent). Alice M. Hill's studies in Fargo and elsewhere show that from a follow-up of physicians' records of tuberculosis there is much more diagnosed tuberculosis in any community than is ordinarily believed to be the case. On the basis of experience showing that about one-third of all cases of tuberculosis discoverable in a community are usually unknown before the adoption of intensive methods of case finding, the National Tuberculosis Association estimates that there are approximately 270,000 active but unknown cases of tuberculosis in the United States at the present time. It is these cases that the early diagnosis campaign seeks to discover.

We commend, therefore, the activities of the national, state and local tuberculosis associations in going back to beginnings and in laying emphasis upon the diagnosis of tuberculosis.

ASSOCIATION NEWS

PROCEEDINGS OF GOVERNING COUNCIL AND EXECUTIVE BOARD

DURING the Fifty-sixth Annual Meeting of the Association at Cincinnati, O., October 17-21, there were three meetings of the Executive Board. The Governing Council met five times, the last being a meeting of the newly elected Governing Council. A digest of the minutes of these meetings and reports of the committees are published here for the information of the Fellows and members of the Association.

GOVERNING COUNCIL PROCEEDINGS OCTOBER 17

Local Committee—William H. Peters, M.D., Chairman of the Local Committee offered the hospitality of Cincinnati and expressed the hope that the meeting would measure up to the high ideals of the Association, and that everyone would find it pleasant and profitable.

Report of the President—This brief report was read by the Executive Secretary and referred the Council to the minutes of the three Executive Board Meetings held during the year.

Report of the Treasurer—Louis I. Dublin, Ph.D., Treasurer, called attention to the growth of the Association as measured by the income and expenditure and increase in assets.

Report of the Executive Secretary—A 5-year report was presented in abstract. (The full report will be sent to members.)

Committee on Administrative Practice—The report presented by Professor C.-E. A. Winslow was accepted. (This report will be published in a later issue of the JOURNAL.)

Committee on Dairy Products—A progress report was presented by William H. Park, M.D., for Professor Henry C. Sherman, Chairman. The final report of the committee will be based on a report made in October by Leslie C. Frank to the U. S. Public Health Service, after several years' study.

Committee on Cancer—This report published in the November, 1927, issue of the JOURNAL, was accepted and the committee continued.

Federal Health Legislation—Some progress has been made in the movement for the coördination of the health activities of the national government, according to the report of James A. Tobey, Dr.P.H., secretary of the committee. At the hearings on the Parker Bill, the American Public Health Association was represented by Herman N. Bundesen, M.D., James A. Tobey, Dr.P.H., George W. Fuller and others. The Parker Bill has been endorsed by a number of influential national organizations. The Governing Council endorsed the recommendations that the Association advance the interests of the Parker Bill in every legitimate way at the 70th Congress of the United States. It was voted to continue the committee.

Committee to Speak for the Association on the Parker Bill—Herman N. Bundesen, M.D., Chairman, recommended that this committee be discontinued and its work transferred to the Committee on Federal Health Legislation. This recommendation was accepted.

Census of Public Health Workers—A plan for making a census of public health

workers outlined by the Executive Secretary was approved. Upon the recommendation of the Executive Board a committee for directing the census will be appointed by the Governing Council.

Election of Fellows—Thirty-eight applications for Fellowship were approved.

OCTOBER 18

Registration Fee for Members of the Association—A proposal to charge a registration fee for members attending the annual meetings was tabled.

Petitions of State Health Societies for Affiliation—The applications of the Ohio Society of Sanitarians, the Northern California Public Health Association and the Southern California Public Health Association were approved. The applications of the Connecticut Public Health Association and the South Carolina Public Health Association were approved subject to these societies complying with the membership requirements.

Committee to Coöperate With the Director of the Census—The President was authorized to appoint a committee of three to act as an advisory committee to coöperate with the Director of the Census in regard to vital statistics.

Editorial Committee—Homer N. Calver, managing editor, reported that the JOURNAL will appear in a new format.

Commissioning of Sanitary Engineers—In reporting for this committee, George W. Fuller, Chairman, said that \$25,000 had been restored to the budget of the U. S. Public Health Service to cover traveling expenses of engineers and to transport their families. The committee was continued.

Committee on Eligibility—The Executive Secretary reported that the applications of 3 societies for affiliation had been approved and that of 51 applications for Fellowship, 38 had been approved.

Council on Standards—The report which included a proposed policy and

scope of activities of the committee and routine procedure for Association committee reports and Section committee reports was accepted.

Annual Meeting Policy—The report of the Finance Committee to which this matter had been referred by the Executive Board was accepted. The report recommended that the continent be divided into 7 districts in which the Association may meet in rotation.

A list of cities in each district in which annual meetings could be held was submitted and a plan for selecting the annual meeting cities was suggested.

The executive office was instructed to assist in the development of regional meetings where desired by the members.

OCTOBER 19

Committee on Industrial Health Service—The recommendations read by W. S. Rankin, M.D., Chairman, were accepted; namely,

First, that the committee be continued as a sub-committee of the Committee on Administrative Practice.

Second, that the membership of the committee be increased.

Third, that the Sub-committee on Industrial Health Service prepare a form for the collection of the essential data with respect to health conditions and health services of industries.

Fourth, that industries be served as a part of the general program of community health service.

Committee on Resolutions—The Resolutions, read by Professor E. O. Jordan, as Chairman, were accepted. (See November, 1927, JOURNAL, pp. 1162-1164.)

Election of Officers—By written ballot, the following officers were elected for 1927-1928: President, Herman N. Bundesen, M.D.; First Vice-President, George W. Fuller; Second Vice-President, William H. Peters, M.D.; Third Vice-President, James Roberts, M.D.; Treasurer, Louis I. Dublin, Ph.D.

Collection and Maintenance of Information Concerning Health Officers—

A suggestion for collecting and maintaining for health officers of the country, accurate information concerning costs, equipment, staffs, plans, etc., of health centers was referred to the Committee on Administrative Practice.

*Association of School Physicians—*A letter was read from the Association explaining its purpose and saying that the members who are also members of the American Public Health Association will endeavor to increase the membership of the Child Hygiene Section and desiring that two sessions be devoted to school medical service at the next annual meeting.

*Advance Meetings of Executive Board—*It was voted that so far as practicable individual members of the Governing Council be advised in advance of the major policies to be considered by the Executive Board.

OCTOBER 20

*Change of Name of Food and Drugs Section—*It was voted to amend the by-laws of the Food and Drugs Section changing its name to Food, Drugs and Nutrition.

*Annual Meeting City for 1928—*By written ballot Chicago was chosen as the annual meeting city for 1928.

*Elective Councilors—*Members elected to the Governing Council, terms expiring 1930, were: John W. Amyot, M.D., George W. Bigelow, M.D., Walter H. Brown, M.D., Herman N. Bundesen, M.D., Edwin O. Jordan, Ph.D., W. S. Leathers, M.D., John E. Monger, M.D., Matthias Nicoll, Jr., M.D., Professor C. E. Turner and C.-E. A. Winslow, Dr.P.H.

OCTOBER 20

*New Governing Council Meets—*The meeting of the new Governing Council was called. The only business transacted was the election of the following mem-

bers to the Executive Board, terms expiring 1929: A. J. Chesley, M.D.; John E. Monger, M.D., and Professor C. E. Turner.

EXECUTIVE BOARD MINUTES

OCTOBER 16

Report of Association Committees—(See digest of Governing Council Meeting minutes on page 74 of this issue.)

*Public Health Year Book—*The plan of this book presented by Arthur Tomalin, was referred to the Finance Committee for further study of its practicability and means of underwriting it.

*New Publication—*In principle the establishment of a new publication was approved. The executive office was instructed to negotiate for the purchase of *The Nation's Health*.

*Reports of Representatives and Delegates of the Association—*These reports were accepted.

*Delinquent Members—*The names of 136 members and Fellows delinquent in payment of dues for 12 or more months were stricken from the Association membership roll.

*Membership Campaign and Census of Public Health Workers—*A plan for an intensive membership campaign and a census of public health workers was approved and a sum was voted to defray expenses of this project. (See Governing Council proceedings on page 74 of this issue.)

*Proposal from the American Institute—*The Board expressed its sympathy with the projects of the Institute and recommended that the Institute seek the coöperation of the American Association for Medical Progress.

*Proposal from Cleanliness Institute—*It was voted to ask the President to appoint a committee on cleanliness and health with power to confer with section officers, the Cleanliness Institute and other bodies, and report back to the Executive Board.

National Tuberculosis Association—The campaign planned by the National Tuberculosis Association for the early diagnosis of tuberculosis was approved and coöperation promised.

Representatives to American Association for Advancement of Science—The President was authorized to appoint delegates from the Fellowship to represent the Association at the meeting of the American Association for the Advancement of Science at Nashville, Tenn., December 26-31, 1927.

AMERICAN CHILD HEALTH ASSOCIATION
TO MEET AT SAME TIME AS AMERICAN
PUBLIC HEALTH ASSOCIATION

THE American Child Health Association of which Herbert Hoover is president, will hold its next annual scientific meeting simultaneously with the Fifty-seventh Annual Meeting of the American Public Health Association and at the same place. This decision was made at the quarterly session of the Executive Committee of the American Child Health Association, December 2, 1927, according to a communication received from S. J. Crumbine, M.D., General Executive.

The A. C. H. A. will hold joint meetings with the Child Hygiene Section and the Public Health Nursing Section of the A. P. H. A., adding considerably to the strength and value of the sessions of these two sections particularly.

This plan was favorably accepted at the meeting of the Executive Board of the American Public Health Association held at the executive office, December 10.

The joint meeting will be held in Chicago, Ill., the week of October 15, with headquarters at Hotel Stevens.

STATE NEWS

TEXAS

Tenth Annual Waterworks School—The school will be in Houston, January

23-27 under the joint auspices of the Texas Section of the Southwest Water Works Association, Texas State Department of Health and the City of Houston. James H. B. House, Houston, is general chairman and W. S. Mahlie, Fort Worth, is director of the school.

Among the lecturers at the school will be: George W. Fuller, consulting engineer, New York, N. Y.; Jane Rider, state sanitary engineer, Arizona; Frank Bachmann, sanitary engineer, Chicago, Ill.; M. Z. Bair, state sanitary engineer, Little Rock, Ark.; Ernest Boyce, state sanitary engineer, Lawrence, Kas.; Arthur Brown, sanitary engineer, Chicago, Ill.; L. H. Enslow, research engineer, New York, N. Y.; Paul Fox, state sanitary engineer, Santa Fe, N. M.; and August V. Graf, city water superintendent, St. Louis, Mo.

Dr. J. C. Anderson, state health officer, is chairman of the Program Committee. Headquarters will be at the Rice Hotel.

Dr. Carrick's Appointment—Dr. Manton M. Carrick, city health officer of Dallas, has been appointed a director of the National Committee for Mental Hygiene.

Pampa Adopts Milk Ordinance—Pampa has adopted the Standard Milk Ordinance recommended by the Texas State Department of Health.

Resolutions of State Sanitarians—Among the resolutions adopted at the recent meeting of the State Association of Sanitarians held at Houston were:

That the Texas State Medical Association investigate the New Jersey plan for licensing health workers with the view of its adoption in Texas;

That arrangements be perfected for holding regional milk sanitation meetings in different parts of Texas in locations conducive to satisfactory attendance in order that the message of the benefits of sanitation may be brought direct to the people.

That inasmuch as the National Dairy Show is one of the most effective mediums for the stimulation of dairying and best business

methods, that efforts be made to bring this show to Texas in the near future.

Better Health Special Tours Texas—The Better Health Special, a coöperative accomplishment of the officials of the Missouri Pacific Railroad and the Texas State Health Department under the direction of Dr. J. C. Anderson, State Health Officer of Texas will visit 75 Texan cities. The train, carrying a health demonstration car, diner and observation Pullman for the lecturers and attendants will leave Longview, January 16.

Education in public health will be featured in the program of the Better Health Special. Rules of sanitation, malaria and typhoid control and other public health measures will be taught by lectures, motion pictures and exhibits. The train will carry an exhibit of modern dairy equipment. The program is arranged for adults and school children.

Dr. Durham, State Registrar, Dead—Dr. C. E. Durham, director, bureau of vital statistics, Texas State Department of Health, died in Austin, November 30, after a short illness. During his 4 years as state registrar, Dr. Durham had accomplished much toward bringing Texas into the birth registration area.

Dr. Durham was a graduate of the University of Texas and the Texas State Medical School. For 24 years he was engaged in the private practice of medicine in Texas.

MICHIGAN

Michigan Public Health Association Meets—The annual meeting of the Michigan Public Health Association will be held in conjunction with the Michigan Department of Health, January 11, 12, 13.

Communicable Disease Control, County Unit Plan, and the Present Status of Scarlet Fever are subjects to be discussed, the last to be presented by

Guy L. Kiefer, M.D., State Health Commissioner.

NEW JERSEY

New Jersey Sanitarians Meet—Incorporation of the New Jersey Public Health and Sanitary Association was provided for in the new constitution and by-laws adopted at the Fifty-third Annual Meeting of the New Jersey Sanitary Association held at Princeton, N. J., December 2 and 3. The following officers were elected:

President, B. S. Pollak, M.D., Secaucus, N. J.; First Vice President, B. H. Obert, Asbury Park, N. J.; Second Vice President, H. B. Costill, M.D., Trenton, N. J.; Third Vice President, D. C. Bowen, Trenton, N. J.; Chairman of the Executive Council, Samuel B. English, M.D., Glen Gardner, N. J.; Representative to A. P. H. A., Edward M. Guion, M.D., Atlantic City, N. J.; Alternate, B. H. Obert, Asbury Park, N. J.

D. C. Bowen, director of health of New Jersey, and chairman of the executive council, presided at the opening meeting. Chester G. Wigley, C.E., Atlantic City, retiring president, in his address spoke on "Recent Progress in Sanitary Engineering Work in the State of New Jersey." Following a paper on "Pre-School Clinics" by Julius Levy, M.D., Consultant, Bureau of Child Hygiene, New Jersey State Department of Health, there was a discussion by E. I. Cronk, M.D., Health Officer of New Brunswick.

The influence of health departments in diphtheria control was discussed by Henry B. Costill, M.D., Trenton; F. P. Lee, M.D., health officer, Paterson; J. Bennett Morrison, M.D., Secretary, Medical Society of New Jersey—all representing the committee on the state wide anti-diphtheria campaign.

The paper "Relation of the Physician to the Patient from a Public Health Standpoint," by Walter Ponder Conway, M.D., Atlantic City, president of the New Jersey Medical Society, was discussed by A. S. Stone, M.D., director of public health, Camden. Joseph R.

Morrow, M.D., superintendent, Bergen County Hospital, Ridgewood, led the discussion on "After Effects of the Use of Serums in the Human Economy."

W. W. Peter, M.D., Associate Secretary of the A. P. H. A. addressed the delegates to the meeting of the Health Officers Association of New Jersey, which was held December 3 in conjunction with the meeting of the sanitarians. A. S. Fell, M.D., presided.

WEST VIRGINIA

West Virginia Public Health Association—How non-professional workers can function in a state-wide health program was the subject of one session of the second annual meeting of the West Virginia Public Health Association, held at Morgantown, November 21-24. At this meeting of the Lay Section of the association the possibility of dovetailing their programs into the community health program was considered from the point of view of the churches, men's and women's clubs, sociological department and the farm extension division of the University of West Virginia, the rural school teacher, and the nutritionist.

Another session was given over to the Health Officers Section and the Public Health Nursing Section.

David Littlejohn, M.D., in his presidential address spoke on "West Virginia's Health Problems." A report of the milk survey in West Virginia was given by Clarence E. Smith, Associate Milk Specialist, U. S. Public Health Service; and H. M. Newton, M.D., federal officer in charge of bovine tuberculosis in West Virginia talked on "Tuberculin Testing of Cattle as a Factor in Producing a Safe Milk Supply."

Josephine Baker, M.D., of New York City spoke on the safeguarding of lives of mothers and babies in West Virginia and Miss Miriam Birdseye of the U. S. Department of Agriculture talked on

"The Nutrition Program as Related to Public Health."

The association passed a resolution favoring the requirements of the Standard Milk Ordinance as recommended by the U. S. Public Health Service and favoring its adoption by the various municipalities of West Virginia.

Another resolution passed endorsed the correlated Country Life Program and recommended that the heads of departments of Agriculture Extension Service, the State Department of Health, the Division of Rural Schools and the State Department of Agriculture meet for the purpose of planning a Country Life Program to be published in bulletin form for the year 1928.

A health exhibit was held under the direction of Miss Dorothea Campbell, director, Division of Public Health Education, West Virginia State Department of Health.

W. T. Henshaw, M.D., Charleston, was elected as representative on the executive council of the A. P. H. A. The officers elected for 1928 were:

President, David Littlejohn, Charleston; 1st Vice-President, J. G. Pettit, M.D., Hopemont Sanitarium; and 2nd Vice-President, W. H. McLain, M.D., Commissioner of Health, Wheeling. Councillors: Marian D. Bell, Fairmont; Gertrude Eckhardt, Keyser; A. L. Oilar, M.D., Glenville; Grace Bauer, Parkersburg; Elizabeth C. Lowry, Logan; and John Thames, M.D., Charleston. Representative on Executive Council, A. P. H. A.: W. T. Henshaw, M.D., Charleston. Officers of the Lay Section elected were: President, Mrs. Dorsey R. Potter, Clarksburg; Vice-Chairman, Mrs. Alice C. Boomsliiter, Morgantown; and Secretary, Mrs. John Stuart, Clarksburg.

Homer N. Calver, Executive Secretary and W. W. Peter, M.D., Associate Secretary of the A. P. H. A. attended the meeting. Dr. Peter was one of the speakers.

DR. JONES REAPPOINTED

Charles Hampson Jones, M.D., for 31 years in the service of the Baltimore, Md., health department, has been reap-

pointed health commissioner of that city. A testimonial dinner was given for Dr. Jones on December 1 by a group of professional colleagues, and he was pre-

sented with a gift of \$500 in gold in appreciation of his conscientious and excellent services in the interest of the public's health. He is a Fellow of the A. P. H. A.

A. P. H. A. CHICAGO ANNUAL MEETING

BECAUSE of the action of Mayor Thompson of Chicago in curtly dismissing from office Health Commissioner Herman N. Bundesen, to replace him with the mayor's personal physician, widespread and bitter protest was received by the Executive Board of the American Public Health Association at its last meeting against holding the Fifty-seventh Annual Meeting of the Association in Chicago next October.

The protest took the form of a resolution offered by a large group of Fellows and members of the Association

from different parts of the country in which it was said—"It is an affront to the public as well as a potential danger when the health officials are selected solely by the whim of political favoritism. Only well qualified sanitarians should be appointed to responsible positions in public health administration."

After lengthy consideration of the protest the Board, largely through the interposition of Dr. Bundesen, decided to go ahead with its plans for the meeting in Chicago.

NEW MEMBERS

The Borden Company, New York, N. Y. Sustaining Member

A. Cavallion, M.D., Paris, France, Director Venereal Diseases Service (Assoc.)

Carlo Cerruti, M.D., Torino, Italy, Assistant to Professor of Hygiene Regia University (Assoc.)

James T. Cornelius, M.D., London, Eng., Assistant Professor of Hygiene (Assoc.)

Louis De Angelis, B.S., New Haven, Conn., Student Yale University Medical School (Assoc.)

Lee E. Edens, M.D., Austin, Tex., Director of Public Health & Welfare

Uarda Faine, Cleveland, O., Director Cleveland Nutrition Clinics

Mary Fischer, R.N., Cincinnati, O., Superintendent of Visiting Nurse Association

Jacob A. Goldberg, Ph.D., New York, N. Y., Secretary Committee for Health Service, New York Tuberculosis and Health Association

Melvin P. Isaminger, Dr.P.H., Ann Arbor, Mich., Instructor Department of Hygiene and Public Health, University of Michigan

G. C. Kelly, M.D., Louisville, Ky., City Health Officer

Clair V. Langton, D.P.H., Ann Arbor, Mich., Teacher and Statistician, Department of Public Health & Hygiene, University of Michigan

Mary L. Markel, Greencamp, O., Teacher
C. H. Michener, Philadelphia, Pa., Secretary and Treasurer Historical Publishing Company (Assoc.)

Iva M. Miller, M.D., Shanghai, China, Director Child Health Department of Council on Health Education

National Dairy Council, Chicago, Ill., Sustaining Member

Northern California Public Health Association, San Francisco, Calif. Affiliated State Health Society

Ohio Society of Sanitarians, Columbus, O. Affiliated State Health Society

Carrie Palmer, R.N., Hemet, Calif., District Public Health Nurse

Anne McF. Sharpe, M.D., Tallahassee, Fla., Professor of Hygiene, State College for Women

Otis Scripter, Ph.D., Zion Ill., Assistant Commissioner of Health

Southern California Public Health Association, Los Angeles, Calif. Affiliated State Health Society

Charles T. Whittier, B.A., New York, N. Y., Secretary, U. S. Manufacturers of Cream of Tartar

Herman F. Wiedeman, C.E., Atlanta, Ga., Sanitary Engineer

BOOKS AND REPORTS

Federal Health Administration in the United States—By *Robert D. Leigh*, *A Barton Hepburn Professor of Government, Williams College. New York: Harper, 1927. 687 pp. Price, \$5.00.*

Here is a book which ought to be read by every one in any way interested in the important problem of federal health correlation, and it could be read to advantage by all who are concerned with public health administration. It is a thorough and scholarly treatise on the development, scope, and present functions of the health organization of our national government, a subject which has recently come to the fore as a result of the surveys and endeavors to secure Congressional action for the more effective coördination of these health activities. As a climax to his descriptions and discussions, the author offers a plan for the centralization of the federal health activities, proposing a new department of education and health, comprised of the Public Health Service, the Children's Bureau, and the Bureau of Education. In many respects, the principles which he sets forth in connection with the proposed reorganization correspond with the Parker bill in their essential features.

This book deals with federal health activities on a functional basis, rather than by the scheme of outlining in detail the activities of each of the many bureaus doing health work. It is, in fact, a philosophical discourse as well as a factual presentation. After introductory chapters on the evolution of American public health organization, and the federal health powers under the commerce, taxation, and other clauses of the Constitution, the author discusses the na-

tional medical care of merchant seamen; medical care and preventive medicine in the army and navy; the same for World War veterans, Indians, territorials and other wards; national quarantine against epidemic diseases; national health regulation of commerce; and such miscellaneous matters as vital statistics, scientific investigation, and education. He concludes with chapters on federal stimulation and aid; public health and the federal problem; the attempts at national health reorganization; public health and national administrative reorganization; and a particularly useful chapter on the personnel problem. Once or twice there seems to be a slightly undue amount of space devoted to venereal disease control.

The book is written in a readable and clear style. It is exceptionally well printed and arranged, though the notes would have been much more useful if they had been placed on each appropriate page, or at least at the end of each chapter, instead of having been assembled at the back. There is an excellent bibliography and also a good index. This important addition to the Harper Health Series is a notable accomplishment with respect to both form and substance.

JAMES A. TOBEY

Personal Health—By *Emery R. Hayhurst, M.D., Professor of Hygiene in Ohio State University and Consultant in Industrial Hygiene to the Ohio State Department of Health. New York: McGraw-Hill, 1927. 278 pp. Price, \$3.00.*

Dr. Hayhurst is widely and favorably known to the public health profession, and this book should add still further to his recognition as a sound and constructive scientist and a progressive sanitarian.

ian. He has undertaken the unusual and worthwhile in preparing a book to "serve the busy person in shop or office as a health guide and a medical advisor." His experience and standing in the field of industrial hygiene is unexcelled and he has drawn upon this wide experience for innumerable incidents and illustrations which add point and interest to the book.

The historical approach is used to introduce the discussion of health and health practices. The body of the book divides the subject of hygiene upon the following bases: digestive system, skin, breathing system, circulatory system, kidney, bladder and sex organs, muscles, bones and joints, nervous and mental health, eyes, ears, glands, cancer. There follow a chapter on the War Upon the Microbe, and a brief chapter containing general advice.

The book is well printed and attractively bound. The 64 photographic illustrations are well chosen. The English is fresh and to the point,—not classical.

The book should be useful to employers, foremen and workers. It deserves to be read. Teachers of adult classes or industrially employed groups should find this a clear, understandable and useful reference or text.

C. E. TURNER

The Principles of Sanitation—By C. H. Kibbey. Philadelphia: F. A. Davis Co., 1927. 354 pp. Price, \$3.50.

This book has been prepared as a practical handbook for public health workers, especially for sanitary inspectors who may or may not have had technical training. The book is based upon a series of lectures and demonstrations given by the author to inspectors.

Chapters dealing with the cause and prevention of communicable diseases are largely non-technical in make-up, but give the essential facts for the group of readers for whom the book is primarily designed. As minor criticisms, the danger of transference through "fomites"

perhaps receives greater emphasis than modern experience now justifies. Unfortunately, "ptomaine poisoning" is used without stating that this term is a misnomer; and the section dealing with food infections is somewhat brief in comparison with similarly important problems. But the book, as a whole, seems well balanced.

The third section, on modern methods of rural sanitation, appeals to the reviewer as the most valuable portion of the book. A section on the prevention of occupational diseases is also of practical value to inspectors and concludes this useful volume, which should prove helpful to many health officers, public health nurses and sanitary inspectors.

IRA V. HISCOCK

Preventive Medicine—By Mark F. Boyd, M.D., 1927.

Influence of Sun Rays on Plants and Animals—By C. G. Abbot. Illus., 1927.

Cold Light—By E. Newton Harvey, Ph.D., 1927.

The History of Organic Evolution—By John M. Coulter, 1927.

The Mosquito Fish (*Gambusia*) and Its Relation to Malaria—By David Starr Jordan. Illus., 1927.

The Parasite Element of Natural Control of Injurious Insects and Its Control of Man—By L. O. Howard, 1927.

William Bateson—By T. H. Morgan, 1927.

These pamphlets ranging from 5 to 20 pages, are reprints from the Smithsonian Institute Report for 1926, and have been prepared by the U. S. Government Printing Office, Washington, D. C., each bearing the Institute seal.

An Elementary Laboratory Guide in General Bacteriology—By *Harold J. Conn, Soil Bacteriologist, New York Agriculture Station; Chairman Committee on Bacteriological Technic, Society American Bacteriologists. Baltimore: Williams & Wilkins, 1927. 165 pp. Price, \$3.00.*

The author's purpose as stated in the preface has been primarily to furnish a laboratory guide to accompany *Bacteriology*, by H. W. Conn and H. J. Conn; but he has given us a manual that should be welcomed by instructors in elementary classes in general bacteriology. The author is eminently qualified to appreciate the needs of the instructor as well as the student and has provided a guide in the general methods that constitute a foundation of both medical and agricultural bacteriological technic.

The book contains chapters on molds, preservatives, germicides and milk. An appendix has been added giving media and staining formulae, reference to literature on stains, and a brief discussion of hyroden-ion concentration. There is excellent material in this little book for demonstrations in applied bacteriology and it offers a valuable guide for instructors in bacteriology in nurses' training schools and technical schools.

C. C. YOUNG

Municipal and Rural Sanitation—*Victor M. Ehlers, C.E., and Ernest W. Steel, C.E. New York: McGraw-Hill, 1927. 448 pp. Price, \$4.00.*

"As modern environment has become more complex, so has sanitation necessarily come to include a wider range of activities." Recognizing this fact, the scope of this book has been made comprehensive. The initial chapter explains communicable diseases. It is followed by discussions of excreta disposal, both with and without water carriage and then 50 pages are devoted to water, its treatment and the protection of its sources.

Next there are treated such subjects as refuse collection and disposal; the characteristics of mosquitoes, their control and the organization of campaigns against them; the control of flies and rodents; the sanitation of milk and other foods, and of schools, swimming pools, and tourist camps; housing with related chapters on plumbing, ventilation and lighting; and industrial hygiene.

In a miscellaneous chapter, hookworm and rabies control, comfort stations and barber shop sanitation are covered. The concluding chapters cover disinfection, vital statistics and public health organizations. In the appendix, representative ordinances on privies, mosquito control and milk sanitation are given.

On the whole, the treatment of the subjects is practical and there are numerous illustrations and diagrams. The book can be used as a text and should prove useful to sanitarians, city officials, inspectors and the like.

ARTHUR P. MILLER

The Microscopy of Drinking Water—By *George Chandler Whipple, Late Gordon McKay Professor of Sanitary Engineering, Harvard University. Revised by Gordon Maskew Fair, Assistant Professor of Sanitary Engineering and Melville Conley Whipple, Assistant Professor of Sanitary Chemistry, Harvard University. (4th ed. rev.) New York: Wiley, 1927. 586 pp. Price, \$7.00.*

A book which has for nearly thirty years been a standard text and which has gone through four editions, needs little comment. Its reputation has been established. In regard to the present edition, it would be necessary only to state that it maintained the high type of excellence shown by the former ones, except for the fact that in the meantime we have had to lament the death of Professor Whipple; so the revision has been made by the Assistant Professor of San-

itary Engineering, and the son of the original author, who is Assistant Professor of Sanitary Chemistry.

The extension of the science to which this book is devoted has necessitated its enlargement and the addition of new chapters. Among these that on "Self Purification of Streams" should be especially mentioned. It is of great interest scientifically and has perhaps been too much overlooked as a practical aid in the past. The authors acknowledge assistance in the revision of certain chapters by men whose names assure us of accuracy and completeness.

The book is abundantly illustrated throughout, but mention must be made of the nineteen colored plates, which are of unusual excellence. A special index of the organisms shown is provided, and in the body of the book, sixteen keys are given to aid in their recognition.

Unquestionably this new edition will be welcomed by all interested in water examination, and like the others, it will take its place as a standard book of reference. The make-up of the book is of the usual high class which characterizes the output of the firm which has produced it.

M. P. RAVENEL

Handbook on Positive Health—
Women's Foundation for Health, 370
Seventh Avenue, New York, N. Y.
Price, \$1.50.

The 1928 revised edition includes two new chapters of remarkably fresh and practical material, one from Mary Swartz Rose, Ph.D., Teachers College, Columbia University, on food values; and the other from Lillian M. Gilbreth, Ph.D., Consulting Engineer, on the balancing of work and rest.

The contributors to the first edition, appearing also in the second, are: Professor E. V. McCollum, Johns Hopkins University, "Nutrition in Relation to Health"; Walter B. Cannon, M.D., Harvard Medical School, "The Heritage of

Life"; William A. White, M.D., St. Elizabeth's Hospital, Washington, D. C., and Jessie Taft, Ph.D., Department of Child Study, Philadelphia, Pa., "Mental Health"; and E. C. Lindeman, New York School of Social Work, New York, N. Y., "Recreation." The interpretation of the health examination blanks, both medical and physical, and a chapter on good body mechanics are also carried from the first edition.

E. H.

Rebuilding the Child. A Study in Malnutrition—*By Dr. Frank Howard Richardson. New York: Putnam, 1927. 319 pp. Price, \$2.00.*

Dr. Richardson's new book on malnutrition is essentially practical. He considers the child as a whole, and the methods he advocates are described in an able and concise manner. These methods are based on sound principles and on his experience in private practice, in hospital clinics and in his own home rather than on current fads.

The author distinguishes two stages of fatigue and he places this factor at the head of that group of signs and symptoms called "malnutrition." This condition must be considered as a clinical entity. The causative factors of this condition are analyzed carefully and evaluated in a convincing way as a preliminary step to the methodical attack upon them in the treatment by which they may be combated and the child improved physically and mentally. The same methods help to maintain the child's health as near as possible at his individual optimum of function. The use of the height-weight-age relationship as one of a number of criteria of optimal physical fitness, is sane and in accord with the best medical practice. This aspect of physical fitness has been much abused by some non-medical workers having too limited a conception of the problem at hand.

Malnutrition cannot be cured by a

proper diet list alone, and the reason this is true is convincingly explained in Dr. Richardson's book.

Every parent and many physicians will profit by considering carefully the chapters on "fatigue," "faulty food habits," "school strain," "family strain," and the intimate relationship between "mentality" and "malnutrition."

It is made perfectly clear by the author that persistent effort on the part of the parent, with the child under periodic examination and supervision, treatment along the lines suggested, is productive of successful results in varying degrees, in a large percentage of cases. The author also states that some malnutrition cases do not seem to respond to any mode of treatment and are baffling and at times discouraging to those who are endeavoring to improve the patient's condition.

Dr. Richardson is frank and sincere and his explanations are clear and convincing.

LEROY A. WILKES

Transactions of Fourth Annual Meeting of American Child Health Association—New York, 1927. 381 pp. Paper. Price, \$3.00.

In these Transactions a clear picture is given of the advance made in the promotion of child health in the last few years by federal and state health and education departments, national organizations, and community groups.

One section of the Transactions is entitled "The Medical School and Child Health. Experience with courses in Preventive Pediatrics and Plans for Future Development," with contributions from faculty members of several leading universities, who are eminent in the field of public health and pediatrics. Reprints of this symposium and reprints of a few individual papers in the symposium can be obtained from the A. C. H. A., 370 Seventh Ave., New York, N. Y.

Another feature of the Transactions

is a series of charts visualizing the progress made in child health in two decades. These charts offer interesting study and at a nominal price reproductions can be obtained in chart and slide form.

Outlines in Health Education for Women—By Gertrude Billhuber, D.P.H. and Isabelle Post, B.S. *New York: Barnes & Co., 1927.* 192 pp. Price, \$2.00.

This book, designed particularly for use in teaching hygiene to college freshman women, consists of thirty-four outlines to cover a college course with periods twice a week. These outlines develop two major lines of interest: first, health promotion; second, disease prevention and control. The material is authoritative, clearly and practically presented, and freely illustrated. I. L. M.

Tierphysiologischen Uebungen—By Dr. Paul Krüger. *Berlin: Verlag von Gebrüder Borntraeger, 1926.* xxxv+518 pp. (180 figs.) Price, 30 Marks.

The fundamental values of the dynamic aspects of animal biology are well illustrated in this handbook for the experimental study of the vital processes and functions of the animal body. It is not a human physiology, although there is constant reference to human processes and functions. The method is a comparative one only in so far as it is necessary or significant to bring in modifications of fundamental processes. The aim of the author is very clearly to present as broad a view as possible of vital activities, and he uses the most available material or subject to illustrate each in turn. The treatment is physico-chemical in the main. Less attention than in most treatises is given to reproduction and to muscle-nerve physiology. Experimental morphogenesis is hardly mentioned.

The text is well illustrated and skillfully set up in differential typography

in condensed, terse, carefully subdivided sections. The treatment is well adapted both for laboratory use and for ready reference as a source book for the latest information on the physical and chemical processes in living substances and for the experimental methods of testing physiological processes of the simpler and more fundamental types. Every biologist should have the book at hand. It has three full indices and an exceptionally complete analytical table of contents.

C. A. KOFOID

Leitfaden zu Tierphysiologischen Uebungen—By *Dr. Paul Krüger*. Berlin: *Gebrüder Borntraeger*, 1927. 92 pp., (29 figs.) Price, 3 Marks.

This laboratory guide is intended to accompany the author's *Tierphysiologische Uebungen*. It contains brief and exact directions for the experiments in the physico-chemical foundations of biology, the substrate of vital phenomena and the widely varied phenomena themselves. All biologists will find this booklet useful as a reference work on many biological tests and a source for many suggestive experiments illustrating important principles. C. A. KOFOID

The Medical Department of the Army—By *James A. Tobey*. Baltimore: *Johns Hopkins Press*, 1927. 161 pp. Price, \$1.50.

The Institute for Government Research, a nonpolitical and extra-governmental association of citizens interested in correct administration of our body politic, has recently published its forty-fifth monograph on the operations of various administrative agencies of the United States.

This monograph, which was prepared for the Institute by James A. Tobey, recites in brief the history, activities and practical organization of the Medical Department of the Army.

The foreword of the booklet contains this statement: "The monographs will serve the double purpose of furnishing an essential tool for efficient legislation, administration and popular control, and of laying the basis for critical and constructive work on the part of those upon whom responsibility for such work primarily rests." The current monograph adequately and competently fulfils this purpose.

The history depicts the gradual up-building, from fragmentary beginnings in 1775, of a great agency of usefulness and mercy. The story is well told, although only the salient facts can be recounted in a work of such limited scope.

The manifold and diverse activities required of the Army Medical Department could not possibly be appreciated by anyone, except by long actual experience or through the medium of such a monograph. Therefore this book will be valuable to all interested in the subject. It will prove useful to medical officers of the army, for it constitutes a comprehensive survey in a convenient form.

The outline of organization affords a broad view of the operations of the department. Divided as it is into Medical, Dental, Veterinary, Administrative and Nurse Corps, with a large force of enlisted and civilian personnel, its functions cover wide fields of endeavor. Its numerous hospitals, dispensaries for treatment and laboratories for diagnosis and research; its schools for basic and post-graduate instruction; the necessity for the maintenance of elaborate records, for the procurement of the thousands of items of supply, for the prevention of disease and for the development of plans against possible emergencies (including immediate aid in public disasters); its great museum and greater library—all these and more require a personnel trained in multifarious ways, of which the monograph presents a clear and accurate picture.

F. R. KEEFER

Health Behavior—*Thomas D. Wood, M.D., Professor of Health Education at Teachers College, Columbia Univ., and Marion Olive Lerrigo, Ph.D., Staff Associate American Child Health Association. Bloomington, Ill.: Public School Publishing Co., 1927. 150 pp. Price, \$2.00.*

Here is a book which will prove of definite value and usefulness in the preparation of a course of study in health education. Teachers and supervisors of health education will find it a valuable reference if they are working in communities which have not developed a detailed health education outline. Health officers will find it of value in presenting a picture of the desirable scope of health education at each age level.

The book consists of six scales each presenting the health habits, attitudes and knowledge which should be acquired by the individual at a particular age level. Scale one presents the habits, attitudes and knowledge which should be acquired by the child before entering kindergarten; scale two by the end of grade 3; scale three by the end of grade 6; scale four by the end of grade 9; scale five by the end of grade 12; scale six those appropriate for adults. These scales have been prepared by accumulating, from literature and public health experience, a complete list of the health problems which confront us and the habits, attitudes and knowledge necessary to solve these problems. From this complete list, the objectives which may reasonably be reached at the various age levels have been determined. The basis of progression recognizes: (1) the needs of the individual, (2) his increasing responsibility, and (3) his interest in an increasingly wider community. Each scale separates the new or changed objectives from those which appear in earlier scales, and it treats separately the habits and skills, the attitudes and the knowledge.

The work is well done and the book is attractively made. It is, of course, a statement of objectives for the teacher and not a textbook for the child. It is not a grade by grade program but rather it groups together objectives for three or more years in each scale. While there might be points of minor difference, there would be essential and general agreement among health education experts upon the soundness of the material.

C. E. TURNER

Feeding Your Baby. Diet for the Child During the First Six Years.

Out of Babyhood Into Childhood. A Health Talk to Parents of Children from Two to Six.

Tuberculosis.

Published by the Metropolitan Life Insurance Company.

These booklets are based on authoritative facts. They can be obtained by writing to the Welfare Education Division, Metropolitan Life Insurance Company, 1 Madison Avenue, New York, N. Y.

After the Rain—*By Grace T. Hallock. New York: Cleanliness Institute. 1927. 96 pp.*

In her usual attractive manner Miss Hallock narrates the cleanliness customs of children in France, Japan, Italy, England, Poland, Finland, Africa and Holland. The book offers material for the story teller at home or in the children's library, and for the primary teachers. It is unfortunate that the illustrations are not comparable with the art displayed in the telling of the story. This book can be obtained by writing to the School Department, Cleanliness Institute, 45 East 17th Street, New York, N. Y.

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

England and Wales—The 1926 report of the Chief Medical Officer is a volume of considerable interest to public health administrators. The report contains 281 pages, including appendices, printed on good soft paper in readable type. Several statistical tables and graphs add to the value of this annual statement, but it is particularly noteworthy to find in an annual health report so much interesting and suggestive descriptive text. A somewhat detailed table of contents occupies 2 pages, making it possible to refer readily to special topics.

The estimated population of England and Wales in 1926 was 39,067,000. The population data are analyzed by age and sex, and the growth of total population is shown in tabular form for previous years beginning with 1871. A birth rate of 17.8 represents a decline of 7.7 per 1,000 since 1920. Infant mortality rates of 70 for 1926, of 76 for 1921–25 and of 149 for 1871–1880 are recorded. Diseases of the heart and cancer were the leading causes of death with rates of 142 and 117 respectively. The statistical tables are worthy of careful study and may be used as models by those preparing annual reports. Data are presented to show that by sickness and invalidity, there was lost to the nation in the year, among the insured population only, and excluding the loss due to sickness for which sickness or disablement benefit is not payable, a total of 28¾ million weeks' work, the equivalent of 12 months' work of upwards of 540,000 persons.

The figures relating to smallpox for the last 10 years show an increase in the number of cases and a decline in the number of deaths, with a case fatality

rate in 1926 of 0.15 per cent (10,141 cases). Isolated outbreaks of the severe type, however, still continue to occur. A statistical study of the recent history of diphtheria in London suggests that the apparent decline in the fatality of this disease may be due, in part, to greater care in the notification of mild or merely suspicious cases.

A careful analysis of maternal mortality shows a rate of 4.12 per 1,000 births registered, with 1.02 deaths of women not classed to pregnancy and child-bearing but returned as associated therewith. "Antenatal supervision is the true preventive midwifery; unfortunately, its general application is a question of the gradual education of a generation unaccustomed to regard the ailments of pregnancy as potential dangers, or to realize how much can be done to avoid subsequent disaster by intelligent anticipation and preparation. . . . There are now 722 centers at which antenatal work is known to be carried out."

"The progress of a nation's health is a secular movement, that is a passage through the centuries, and founded mainly upon an exclusive regard to the immediate interests and problems of human survival.—We who are the medical or administrative servants of this undertaking must not allow ourselves to become customary or routine in thought, action or outlook."

Hartford, Conn.—The annual reports of the Hartford Board of Health for 1925 and 1926 are published together in a volume of 28 pages. Following a page devoted to the board organization, is the financial statement which indicates total expenses for 1926 of \$161,307 as compared with \$170,371 in 1925, the

reduction being due to lowered isolation hospital costs.

A population of 164,228 in 1926 is noted, with a death rate corrected for residence of 10.57. A death rate of 53 from tuberculosis, all forms, is noteworthy. A birth rate of 20 and an infant mortality rate of 72 are reported. Approximately 50 per cent of the resident births occur in institutions, and 7 per cent of the births are attended by midwives.

The Visiting Nurse Association is employed by the board to carry on the child welfare work with infants and preschool children. There are 11 stations, 6 of them being in school buildings. The numbers of home visits by the nurses was 35,994 in 1925 and 32,256 in 1926. The number of visits to clinics was 12,771 in 1925 and 16,992 in 1926. The supervision of tuberculosis cases by a department of the Visiting Nurse Association, while financed by the Community Chest, works also in close cooperation with the Board of Health. The Hartford Dispensary operates two clinics for the examination of adult tuberculosis cases, and a third clinic for children is maintained at Mitchell House—the State Tuberculosis Commission furnishing a physician, the Visiting Nurse Association, the nursing assistance, and the Board of Health, the maintenance charge.

Richmond County, N. C.—This county of 35,000 people has a board of health of 5 members and a staff consisting of a medical health officer, a nurse, and a stenographer-clerk. The report for 1926 indicates that this is a progressive agricultural and manufacturing center where cotton and peaches are grown extensively, although there is a diversification of farm products.

The county health department is maintained jointly by the state and county, the total appropriations amounting to \$8,100. A condensed resume of

1926 gives the cost equivalent valuation system in vogue in North Carolina. It is calculated that during the year, \$7,263.75 was expended; that the total cost equivalents, in services rendered, produced \$17,523.57; giving the earning per dollar invested during the year as \$2.41. These services consisted of immunization, medical and nursing visits, infant and maternal hygiene work, laboratory work, and regular health department activities. The program for 1927, outlined on the last page of the report, includes the inoculation of all children from 6 months to 16 years of age with toxin-antitoxin, and Schick tests of all that have been previously inoculated.

League of Nations—The annual report of the health organization for 1926 shows that 3 sessions of the health committee were held during the year. The actual expenditure (in Swiss francs) in 1925 amounted to 1,544,132, and the estimated expenditures for 1926 are only slightly higher than this figure. During the year particular attention was devoted to the reception and dissemination of weekly telegraphic epidemiological intelligence and of information in regard to the movement of infected ships. These reports have proved to be of enormous interest and value in various sections of the world.

Progress is being made in the standardization of morbidity and mortality statistics, and in the revision of the *International List of Causes of Death*. A group of administrative statistical experts have been invited to sit on the Health Committee to consider the latter problem. An impressive list of epidemiological and statistical publications of the Health Organization is contained in this annual report, together with an account of the work of the various Commissions. These Commissions represent a broad scope of interest, including malaria, permanent standards (sera, drugs, tests), sleeping sickness, opium, cancer,

tuberculosis, public health training, and smallpox and vaccination.

Cleveland, O.—The Cleveland 1926 report contains 34 valuable statistical tables, a map showing the health districts and the location of health stations, together with descriptive text. The death rate was 11.07, and the birth rate was 20.4. Over 47 per cent of all births were registered from either maternity hospi-

tals or in the maternity wards of general hospitals. An infant mortality rate of 71.2 is recorded. It is noteworthy that 35,699 visits were made to infant welfare stations. The average attendance per clinic has increased from 12.9 in 1920 to 14.3 in 1926. A plan to provide protection against diphtheria for children under school age through infant welfare stations has been inaugurated.

BOOKS RECEIVED

- HFAITH PROBLEMS IN ORGANIZED SOCIETY** By Sir Arthur Newsholme London King & Son, 1927 253 pp Price, \$3.60
- AN ELEMENTARY LABORATORY GUIDE IN GENERAL BACTERIOLOGY** By Harold J. Conn Baltimore Williams & Wilkins 1927 165 pp Price, \$3.00
- DICTIONARY OF BACTERIOLOGICAL EQUIVALENTS** By William Partridge Baltimore Williams & Wilkins, 1927 141 pp Price \$4.00
- KEEPING WELL** By Kate Platt London Faber & Gwyer, 1927 246 pp Price, \$1.25
- HEALTHY CHILDHOOD BETWEEN INFANCY AND SCHOOL AGE** By Mary E. Weston London Faber & Gwyer 135 pp Price, \$1.10
- AFTER THE RAIN CLEANLINESS CUSTOMS OF CHILDREN IN MANY LANDS** By Grace T. Hallock New York Cleanliness Institute 96 pp Limited free distribution
- THE RISE AND FALL OF DISEASE IN ILLINOIS Vol. 1** By Isaac D. Rawlings, M.D. Springfield State Department of Health 432 pp
- PROCEEDINGS OF THE CONFERENCE OF SOCIAL WORK, FIFTY-FOURTH ANNUAL SESSION, held in Des Moines, Iowa, May 11-18, 1927** Chicago University of Chicago Press, 1927 736 pp
- OUR TIMES AMERICA FINDING HERSELF** By Mark Sullivan New York Scribners, 1927 668 pp Price, \$5.00
- FOOD AND DIETETICS** By Robert Hutchison (6th ed.) New York Wm. Wood, 1927 610 pp Price, \$5.00
- TOBACCO AND PHYSICAL EFFICIENCY A Digest of Clinical Data** By Pierre Schrumpt-Pierron, M.D. New York Hoeber, 1927 134 pp Price, \$1.00
- AMERICAN ILLUSTRATED MEDICAL DICTIONARY (14th ed.)** By W. A. Newman Dorland Philadelphia Saunders, 1927 1388 pp Price, \$7.00 Thumb Index, \$7.50
- INTERPRETERS OF NATURE** By Sir George Newman New York Oxford University Press, 1927 296 pp Price, \$4.50
- LIGHTERS OF FATE** By J. Arthur Myers Baltimore Williams & Wilkins, 1927 318 pp Price, \$3.00
- MODERN METHODS OF TESTING MILK AND MILK PRODUCTS (3rd ed. rev.)** By Lucius L. Van Slyke New York Orange Judd Pub. Co., 1927 344 pp Price, \$2.00
- LISTER AS I KNEW HIM** By John Rudd Leeson New York Wm. Wood, 1927 212 pp Price, \$3.50
- TOWARD THE LIGHT** By Mary Fels New York George Dobson, 1927 281 pp Price, \$2.50
- NUTRITION AND HEALTH With Twenty Suggested Lessons for Nutrition Classes** By Helen Rich Baldwin New York The Borden Co., 1927 104 pp
- THE DIABETIC LIFE Its Control by Diet and Insulin (3rd ed.)** By R. D. Lawrence Philadelphia Blakiston 1927 185 pp Price, \$2.50
- ANNALS OF THE PICKETT-THOMSON RESEARCH LABORATORY Vol. III (Complete) November, 1927** Published by The Pickett-Thomson Research Laboratory, St. Paul's Hospital, Endell St., London, W.C.2, Eng (Williams & Wilkins distributors) 316 pp Price \$10.00
- THE NORMAL DIET** By W. D. Sansum (2d ed.) St. Louis Mosby, 1927 136 pp Price, \$1.50
- USE AND TESTING OF SPIRIGOMANOMETERS** By J. L. Wilson, H. N. Eaton and H. B. Hendrickson Technical Papers of the Bureau of Standards, No. 352 Washington Department of Commerce 764 pp
- STUDIES OF THE EFFICIENCY OF WATER PURIFICATION PROCESSES** Public Health Bulletin No. 172 Washington Government Printing Office, 1927 423 pp
- CLINICAL AND ABNORMAL PSYCHOLOGY** By J. E. Wallace Wallin New York Houghton Mifflin, 1927 649 pp Price, \$3.00
- ABOUT OURSELVES Psychology for Normal People** By H. A. Overstreet New York Norton, 1927 300 pp Price, \$3.00
- THE HUMAN BODY** By Logan Clendening New York Knopf, 1927 399 pp Price, \$5.00

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

The Bacteriophage Again—An involved discussion of the plurivirulence and the complexity of the bacteriophage, from which final conclusions as to the nature of the phenomenon remain unannounced in this, the first part of a lecture.

BRUYNOGHE, R. The Twort-D'Herelle Phenomenon. *J. State Med.*, 35:11 (Nov.), 1927.

Sewage Tank Design—The majority of sewage settling tanks are inefficient. They should be built to obtain an even distribution of flow at both inlet and outlet ends, and about four times as long as wide. Although baffles may be helpful, they are more often detrimental.

CAPEN, C. H., JR. Study of Sewage Settling Tank Design. *Eng. News Rec.*, 99:21 (Nov. 24), 1927.

Dental Hygiene—A British summarization of the causes of dental decay—a chemico-parasitic theory. The fermentation of starches and sugars about the teeth is the alleged cause. Induce children to banish sweets, eat roughage, and "swill" (rinse) the mouth after eating, and all will be well.

COLYER, F. The Prevention of Caries in Children. *J. Roy. San. Inst.*, 48:5 (Nov.), 1927.

Cereal Diets—White rats fed suitable supplementary foods made normal growths when 84 per cent of the calories were obtained from whole grain cereals. The authors conclude that cereals might be used to a much greater extent in human diets than is customary in America.

COWGILL, G. R., et al. Studies on the Effects of Abundant Cereal Intake. *J. A. M. A.*, 89:21 (Nov. 19), 1927.

Comparison of Diphtheria Immunity—Diphtheria and scarlet fever are

much lower in incidence in Rio de Janeiro than in the United States cities, yet the prevalence of immunity to these diseases, as revealed by tests, is higher. The authors interpret this to mean that infection is more common in the former place.

DOULL, J. A., et al. Common Infectious Diseases in Brazil. (and) Results of Schick and Dick Tests in Rio de Janeiro. *J. Prev. Med.*, 1:8 (Nov.), 1927.

The Vitamins—A brief summarization of the present-day knowledge regarding vitamins.

EDWARDS, M. M. The "Little Things" that Nourish Our Body. *Pub. Health Nurse*, 19:11 (Nov.), 1927.

Gelatin in Ice Cream—Samples of gelatin tested bacteriologically indicated that some lots might affect the bacterial count of ice cream made from cream of low bacterial content. But when added to a mix of high bacterial content (especially when the mix is later to be pasteurized), no appreciable difference in the count should result.

FAY, A. C., and OLSON, N. E. The Effect of Gelatin on the Bacterial Content of Ice Cream Mix. *J. Bact.*, 14:5 (Nov.), 1927.

Modified Measles—This is a report of the use of serum from family donors, when convalescent serum is not available, to modify measles in young contacts.

FORBES, R. P., and BERRYMAN, G. Modified Measles. *J. A. M. A.*, 89:19 (Nov. 5), 1927.

Food Fads—The dietary commandments of the food faddists are given a scorching going over that reduces them to absurdity. This is an excellent paper to stimulate the sanitarian to find out what is really known about nutrition.

HARDING, T. S. Common Food Fallacies. *Scientific Monthly*, (Nov.) 1927.

Tularaemia in Ticks and Bedbugs—A description of the microscopic changes in ticks and bedbugs infected with tularaemia. The epithelial cells of the gut were found swollen and packed with organisms. Organisms could not certainly be identified in salivary glands and a number of other organisms.

FRANCIS, EDWARD. Microscopic Changes of Tularaemia in the Tick *Dermacentor andersoni* and the Bedbug *Cimex lectularius*. Pub. Health Rep., 42:45 (Nov.), 1927.

Hookworm Prevention—Whole-sale treatment for hookworm infestation without sanitation to prevent its continuance resulted in reinfestation in one year of considerable proportions, indicating that in three years the infestation would have reached its previous level.

HILL, R. B. Hookworm Infestation in an Unsanitated District After an Intensive Treatment Campaign. J. Prev. Med., 1:8 (Nov.), 1927.

Activated Sludge Sewage Disposal Plant—Experience in operating the Essen sewage disposal plant indicated the value of adding water heated to 70–80° F. directly to the sludge at the bottom of the digestion tank during cold weather in order to stimulate bacterial action.

JMHOFF, K. Operating Results of the Essen Activated-Sludge Plant. Eng. News-Rec., 90:20 (Nov. 17), 1927.

Syphilis Precipitation Tests—The “pros” of the Kahn precipitation test for syphilis—including the claims of marked specificity, sensitiveness, simplicity, and freedom from error—are presented again by Dr. Kahn. Some of the “cons” are suggested by the discussers of the paper.

KAHN, R. L. Five Years Application of the Kahn Test. J. A. M. A., 89:22 (Nov.), 1927.

Public Health Nursing—The nursing program of the New York State Department of Health is interestingly told in this brief paper. An excellent statewide nursing scheme.

KUHLMAN, M. S. New York State Public Health Nursing. Nation's Health, 9:11 (Nov. 15), 1927.

Studying Juvenile Delinquents—This discussion of the procedure for studying delinquent children will be of interest to all health officials who have any social problems to face—and this should include all officials except, perhaps, plumbing inspectors.

McIVER, J. The Juvenile Delinquent. J. A. M. A., 89:19 (Nov. 5), 1927.

Posture Studies—A correlation is shown between defective posture and pathologic conditions of the female genital organs. This is another reason for including correct posture among the rules of hygiene.

MILLER, N. F. Posture Studies in Gynecology. J. A. M. A., 89:21 (Nov. 19), 1927.

Do Adults Contract Tuberculosis?—When one of the consorts died of tuberculosis the mate was found to be infected in half the cases. The author concludes that with mass infections and lowered resistance adult infection is frequent.

MINNIG, ARNOLD. Conjugal Tuberculosis. J. A. M. A., 89:21 (Nov. 19), 1927.

What to Eat—The keynote of a successful diet is variety—always including milk and green vegetables. Good material presented in a usable form for the sanitarian who is trying to educate.

NEWMAN, SIR GEORGE. The Relation of Food to Health. Better Health (British), 1:2 (Nov.), 1927.

Industrial Mortality—A study of available statistics indicates that tuberculosis is declining as a cause of death of workers, and that it is superseded by cardiac conditions.

PEDLEY, F. G. The Trend of Occupational Mortality in the United States. J. Indust. Hyg., 9:11 (Nov.), 1927.

Eugenic Sterilization—Another paper of a series dealing with the sterilization of defectives; this paper shows

the increase of first admission sterilizations, particularly single women. It should be done early to prevent the birth of defective children.

POPENOE, PAUL. Eugenic Sterilization in California. *J. Soc. Hyg.*, 8:8 (Nov.), 1927.

Sex Differences in Tuberculosis—More females than males die of tuberculosis during the ages 5-24 (maximum 10-14). Probably the causes are biological; the reasoning by which this conclusion is reached is interestingly presented.

PUTNAM, PERSIS. Sex Differences in Pulmonary Tuberculosis. *Am. J. Hyg.*, 7:6 (Nov.), 1927.

Trends in Typhoid Mortality—The accelerated trend of the typhoid fever decline beginning during the latter part of the 19th century to date. The present-day importance of carriers is discussed.

PUTNAM, PERSIS. The Trend of Typhoid Fever Mortality in the United States. *Ibid.*

Maternal Transmission of Hypersensitiveness—The first papers of this series review the findings of others in studies of the transmission of hypersensitiveness from mother to offspring through the placenta and through colostrum and milk. The last papers report studies of the guinea pig which support the hypothesis that human infants manifesting an allergic state have been sensitized in the uterus of the mother.

RATNER, BRET, et al. Transmission of Protein Hypersensitiveness from Mother to Offspring. *J. Immunol.*, 14:5 (Nov.), 1927.

Testing for Carbon Monoxide—A report on the use of the Sayres-Yant method for the determination of carbon monoxide in garages, and a description of the apparatus used.

SALLS, C. M. Carbon Monoxide Tests in Commercial Garages and Automobile Repair Shops. *Ind. Hyg. Bull.* (N. Y. State Dept. of Labor), 4:5 (Nov.), 1927.

Measles Management—An interesting description of the care of measles cases in cubicles. The nursing technic which prevents cross infections is described.

SPENCER, H. J. The Management of Measles in Hospital and Home. *J. A. M. A.*, 89:20 (Nov. 12), 1927.

Radio Health Talks—An attempt to evaluate a series of health talks given from Syracuse. A questionnaire was broadcast and a prize offered for the best answer. Fifty-five replies were received, from which it is estimated that 5500 people listened to the talks.

STONE, J. G. Radio Health Education Talks and Their Results. *Nation's Health*, 9:11 (Nov.), 1927.

Child Welfare—This is a brief discussion of the infant welfare program adopted by the City of Winnipeg. Nothing new.

TUSTIN, P. B. Child Welfare Work in Winnipeg, Canada. *J. Roy. San. Inst.*, 48:5 (Nov.), 1927.

Health Improvement vs. Disease Prevention—An interestingly presented suggestion that health measures may be of immediate benefit to the individual yet react unfavorably upon public health in the long run. This paper should be reprinted in an American publication so that all might read the author's plea for health official participation in all social activities leading to the *improvement of health* as well as disease prevention.

WHEATLEY, J. Relative Values in Health Work. *Pub. Health*, 51:2 (Nov.), 1927.

Mental Hygiene Defined—The inclusiveness of the mental hygiene field, the need for expertly trained leaders and workers, and the possibilities are considered.

WILLIAMS, F. E. Mental Hygiene: An Attempt at a Definition. *Pub. Health Nurse*, 19:11 (Nov.), 1927.

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D.P.H.

Epidemiology of Diphtheria—Dr. James A. Doull of Johns Hopkins University presents an outline of the epidemiology of diphtheria in the *Nations Health* for November, 1927. He summarizes his discussion with the following:

1. With rare exceptions the sources of infection in diphtheria are entirely human, namely, cases and carriers.

2. The ordinary mode of infection is directly from person to person.

3. Children are more liable to attack than adults because the latter are more commonly immune.

4. The lower prevalence of the disease in the tropics is due either to a higher degree of natural resistance possessed by the inhabitants or to the bacillus losses in virulence in the warm countries.

5. The lower rates in rural than in urban areas may be explained by less opportunity for contact in the former and a consequently lower infection rate.

As methods of prevention the author stresses: (1) the need of active immunization, (2) isolation, and (3) specific treatment as early as possible.

Cancer Division in Detroit—The *Bulletin* of the Wayne County Medical Society for November 29, 1927, contains the first preliminary report of the Cancer Division of the Detroit Department of Health, which division was established 6 months ago.

During the first 4 months' operation of the newly created division there was a total of 307 deaths from cancer. Of this number 85 occurred from cancer of the stomach. Early and radical operation is the only possible cure for stomach cancer. Of the first 50 deaths, 11 were operated upon, and in four instances an exploration was made. Cases of stomach

cancer when discovered are often too far advanced for surgical interference. The report estimates that somewhere between 40 and 50 per cent of stomach cancer can be recognized soon enough, and are in proper location for radical removal. This is far from the hopelessness which we feel today, but it will only be realized when all indigestions, especially in middle life, are carefully investigated with the X-ray, and operations undertaken without delay if suspicion of cancer exists.

Approximately one-third of the deaths studied in this report were operated upon. Breast cancers were operated upon with the greatest frequency.

The Cancer Division of the Detroit Department of Health is under the direction of Dr. Harry C. Saltzstein, who has medical and nursing assistance. It is now engaged in surveying deaths from cancer, but plans to extend its studies to cases. The program of the department includes stimulating attendance at cancer clinics for early diagnosis, the establishment of a suitable number of hospital beds for early and advanced cases; the education of the public through pamphlets, newspaper articles, and lectures; and the instruction of practicing physicians through clinics and lectures.

League of Nations Epidemiological Report—The *Fourth Epidemiological Report of the Health Section of the League of Nations* for the year 1926 has just appeared. This fourth report is presented in a different form from that of the previous reports. The tables were formerly arranged so as to show each country separately, but now all information is grouped according to disease.

Information on the prevalence of notifiable diseases is now received by the Health Section from practically all countries where such information is collected. The report contains a general view of the prevalence of the infectious diseases throughout the world, together with tables of general mortality, birth rates, infant mortality, and deaths from certain specified causes in large towns.

In discussing the general decline in the diphtheria death rate credit is given to toxin-antitoxin immunization, but mention is also made of the fact that the decrease may be at least partly due to the diminished proportion of children in the population due to the falling birth rate. In the United States the decrease, which had been about 24,000 cases a year between 1922 and 1925, diminished to only 3000 from 1925 to 1926. It is suggested that the reason may be that a new natural rise of the incidence is due, but is nearly checked by the preventive measures.

Scarlet fever is rare in tropical and sub-tropical countries. In Egypt, for example, there were only 6 deaths from scarlet fever in 1926, compared with 617 from diphtheria, and 9149 from measles. Scarlet fever is fairly prevalent in Northern China, but rare in the South. It occurs in Chosen without being very common; it is more common among the Japanese than among Koreans. Scarlet fever has spread steadily in Japan in recent years, but is of common occurrence only in the large towns.

Influenza Epidemic of 1918—The *Journal of the American Medical Association* (November 5, 12, 19, 1927) has been publishing a series of articles dealing with the influenza epidemic of 1918, by Professor Edwin O. Jordan. Professor Jordan, after discussing the incidence of influenza, deals in greater detail with some of the specific control methods em-

ployed throughout the world. Regarding isolation and quarantine he states:

It is quite safe to assert that perfect isolation of an individual or group during an influenza epidemic constitutes a complete protection against the disease. Indeed, it is possible to go further and to maintain that where, as in most cases, it is not practicable to avoid outside human contact altogether, reduction of such contact to a necessary minimum confers some degree of protection, although naturally this is never absolute.

With regard to the closure of schools, Jordan concludes that in large communities little if anything is to be gained by such closure. In smaller towns and in rural sections where general group contacts are not very numerous, restrictive measures may possibly be of service in diminishing the spread of infection. He states with respect to the use of face masks:

The conclusion seems warranted that those attending or examining influenza patients may obtain some measure of protection by wearing properly constructed face masks and eye goggles. On the other hand, the practical difficulties in the way of mask wearing by the general public seem insuperable and render this measure one for individual rather than general prophylaxis.

A rather complete resume of the use of vaccines for prophylactic purposes in civil and military life constitutes a portion of the third article:

Protection against influenza by vaccine inoculation is evidently a broken reed on which to lean. It is not surprising that this is so, since the nature of the causal organism of influenza is still in question. It is disappointing that inoculation with *Bacterium pneumosintes* has not as yet given unmistakable evidence of protective effect; more experiments with this organism should be made. Whether any protection against complications and the secondary infections with pneumococci and other organisms that follow in the wake of influenza can be imparted is uncertain, but deserves further study. Finally, the fact that an attack of influenza confers no such definite and durable immunity as an attack of typhoid or smallpox makes all attempts at this time to produce immunity by inoculation seem distinctly unpromising.

LABORATORY

C. C. YOUNG

THE BUCK PLATE COLONY COUNTER

T. C. BUCK, JR.

Bureau of Bacteriology, City Health Department, Baltimore, Md.

PLATE counting of bacterial colonies in milk, water, ice cream, soft drinks and canned goods has long required an apparatus or method by which more accurate counts can be obtained. Observations from a dozen laboratories have pointed out as many different methods for making such counts.

Correlations of counts from the same plate, within the limits of personal error, could hardly be expected from such varied methods unless the colonies were large enough to be counted with the naked eye or with slight magnification.

Certain bacteriologists engaged in public health work, as well as those in the commercial field, have a tendency to overlook the smaller colonies sometimes present. This may be due to lack of proper equipment such as magnification and illumination. However, not to observe the so-called pin point, transparent and opalescent colonies is to overlook an undesirable condition of milk, water or food. There have been numerous isolations of pin point colonies which have proved to be streptococci, and these have been traced directly to the infected cow with mastitis.

REVIEW OF LITERATURE

Stewart (1906)¹ designed a counting chamber which has been extensively used throughout the country. This counter proved of great value in counting the larger colonies in the milk flora.

Buck and Swenarton (1924)² designed a counter with special attention to pin point colony counting. This counter had

many advantages, as it provided a direct and indirect source of light upon the colonies, agar bubbles, and debris between which it is at times very hard to distinguish.

A recent article by A. C. Fay (1927)³ points out the danger of pin point colonies being overlooked in plate counting, which tends to minimize the value of one of the most widely used procedures of milk control. Undesirable sanitary conditions of the milk due to their presence may also escape attention. He has covered the literature on this subject so thoroughly that repetition seems useless.

OBSERVATIONS

In 1923 the non-correlation of milk and ice cream counts was so marked that it caused no little concern in the laboratory. Counts and recounts were made with great variations. Recounts of the same plate by a number of different workers differed widely. The plates selected for these observations were those containing the smallest colonies, which were soon termed the common pin points.

The laboratory was then using for a colony counter the simple ruled plate (Jeffer) and a hand lens with no artificial light. Therefore on a bright, sunshiny day one counted more colonies than on a dark, cloudy one. Artificial light was then supplied with the development of the present counter.

DESCRIPTION

The counter is now supplied with artificial light from an elongated, 25-watt

ground glass bulb (represented by (J) in Figure I), which is incased in a ducoed metal frame. The case is so constructed that all outside light is excluded, and it is provided with two doors for this purpose. The tray holds, first, a dark blue glass plate (E). This permits indirect light rays to come from beneath, giving a translucent light which is much desired in counting transparent and opalescent colonies. Upon the blue plate is placed the ruled Jeffer plate (D), and then the protective glass plate (C). The latter plate provides a depth which enables one to see through the Petri dish before the lines of the Jeffer plate are reached, and should be replaced at intervals to avoid the accumulating scratches. Inside the casing, there are two rotating mirrors, (F) and (G), and also two stationary ones. (I) and (H).

These provide the amount of uniform light desired both above and below the plates.

The entire counting field is visible (instead of only a portion), as the counter is equipped with a specially designed $3\frac{1}{2}$ times lens, (A), as specified in *Standard Methods* of the American Public Health Association.

By reason of the brilliant illumination and special lens set in a stationary position, the operator can readily distinguish pin point, transparent and opalescent colonies, and will not confuse them with agar precipitates, bubbles, or debris.

The counting may be done with much greater speed, far more accurately, with less tedium and much less eye strain than with other counters.

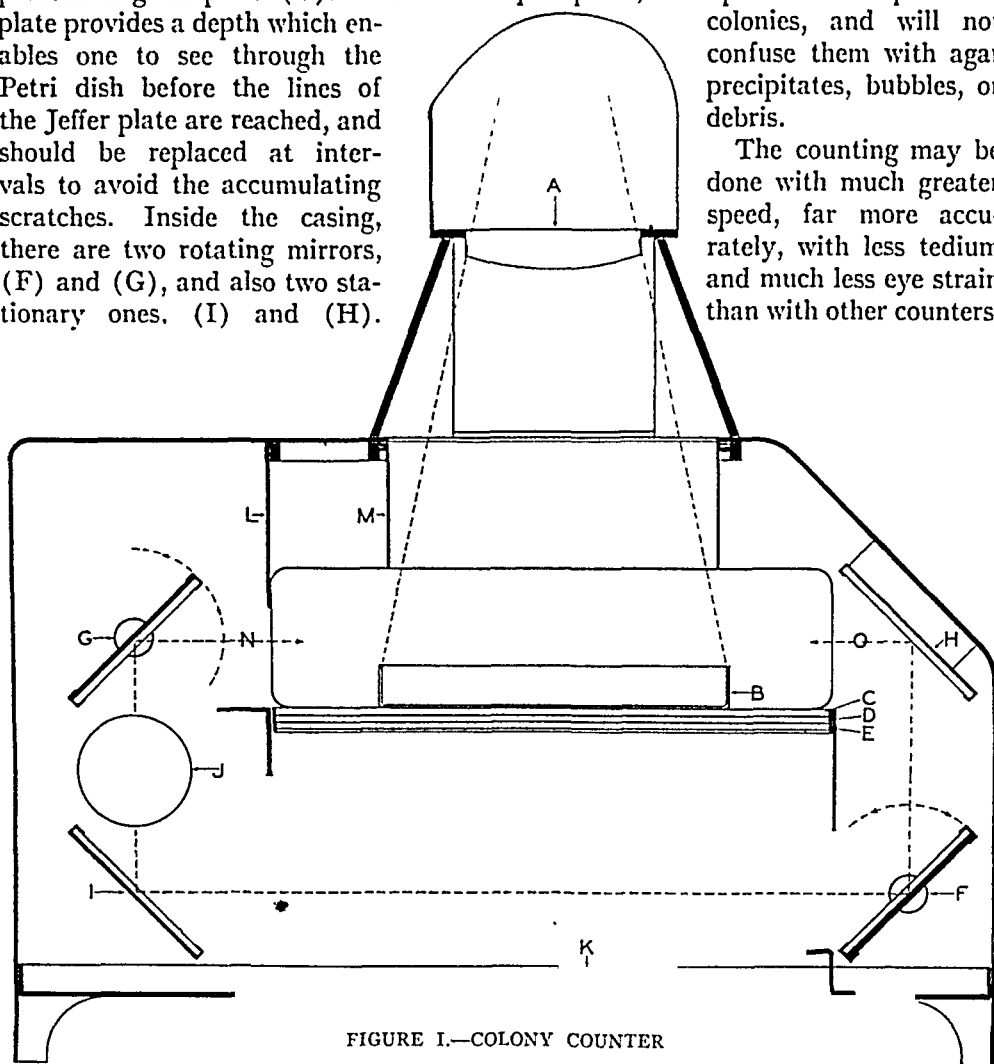


FIGURE I.—COLONY COUNTER

A—Lens
B—Petri dish in proper position with top removed
C—Protective glass plate
D—Jeffer plate
E—Dark blue glass plate
F and G—Rotating mirrors

H and I—Stationary mirrors
J—Elongated electric bulb.
K—Ducoed reflector
L and M—Light guards
N and O—Directed light rays

The plates to be counted are usually arranged on the left hand side. The top is removed; the plate is placed in the counter, and then counted. The top is then replaced on the right hand side. The Petri dishes are placed in a convenient pile or basket. Inverted plates placed in the counter are not desirable, as the scratches on the Petri dish will obliterate the small colonies and do not allow the proper magnification.

EXPERIMENTAL WORK

A comparison between the Buck counter and other prevailing counters was established from nearly 1,000 plate counts. These plates were selected and placed in three groups, namely, A, B and C, all counts being made according to *Standard Methods* of the A. P. H. A.

Group A—This consisted of about 360 plates containing pin point colonies, agar precipitates and debris. There existed no correlation between the different methods, this counter registering from 10 per cent to 250 per cent more colonies than the counts by the ruled glass hand lens method, the Stewart, or the Buck-Swenarton counter.

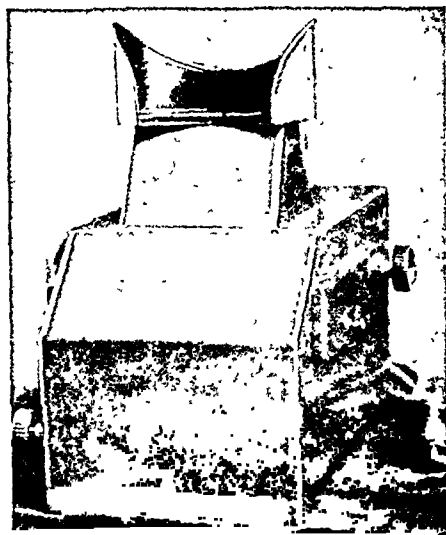
On several plates by three different workers there were declared no colonies by the hand lens method and the Stewart counter. The present counter registered from 60 to 240 colonies in the several plates. On recount of these plates by five different technicians, all using the new counter, a very high percentage correlated.

Group B—This consisted of 340 plates containing large and small colonies of opalescent or transparent colon bacilli and common udder cocci. Of the 340 counts, 60 per cent was higher by the new counter. On 30 per cent of the counts the other methods showed slightly higher counts, but it was found that they included quantities of precipitates and debris. This result was obtained by circling the colony or debris in question with a pencil, and their identity was then established by the compound microscope.

Group C—About 300 plates were selected for the larger colonies of the common lactic acid type. All methods gave approximately the same results.

From Groups B and C, about 100 Breed counts were made and compared to the results obtained by the Buck

counter and the ruled glass and hand lens. The Buck counter showed that 86 per cent was nearer to the approximate



Colony Counter—Front View.

plate count computed from the Breed count, of which only 6 per cent was approximately the same. The ruled glass and hand lens method gave 8 per cent nearer the approximate plate count computed from the Breed count. These counts were selected for comparison in the hope of securing something near the maximum differences occurring when the very small or pin point colonies were present. Seventy per cent of the Breed counts showed numerous cocci in short chains or in small groups of 4 to 10 cells. These were designated as probable thermotolerant streptococci. Better correlation between the Breed and plate counts was obtained with the new counter.

OBSERVATIONS OF PIN POINT COLONIES

Group I—Pin point colonies, or ones closely resembling them, may be found after repeated pasteurizations of raw milk. Sixty-one samples of raw milk that were selected were pasteurized at 63° C. for 30 minutes, cooled to 8° C., and held at this temperature from 12 to 14 hours. They were then repasteurized and cooled three times, plated and counted after

each cooling. Of the 61 samples 48 per cent produced these small or pin point like colonies usually after the third pasteurization.*

Group II—Fifteen samples of milk from cows suffering with mastitis were plated; 7 of these proved to contain typical pin point colonies. These were about 0.175 m.m. in the longest dimension. The Breed counts showed many short chain streptococci. Isolations and cultures of these were also typical of the streptococci group.

Group III—From more than 500 plate cultures 10 strains of these thermophilic colonies were successfully isolated. These colonies presented themselves in a ratio of 10 to 1 over the other groups. Ten strains were successfully isolated, 2 of which were traced directly to cows with mastitis. These colonies were much smaller than those of the other groups. The Breed counts were higher and these organisms resembled those of Group II. In some cases the chain-like formation was shorter, presenting small chains of from 8 to 10 cells. The plate counts from this group were found to correlate through the three dilutions, namely, 1 to 100, 1 to 1,000, and 1 to 10,000. The approximate plate counts ranged from 150,000 to 5,000,000. These colonies under the lower power microscope presented a small, round, irregular, somewhat transparent appearance, measuring about 140 m.m. in the longest dimension. They were non-motile, Gram positive cocci, somewhat smaller than the short-chained streptococci. Streaked on blood agar a very fine, transparent growth appears after 48 hours, and a slight laking of the red cells

takes place. The thermal death range is somewhat above 80° C. for 10 minutes. They are heat resisting, hemolytic streptococci, and no doubt may be quite troublesome to both the dairies and health departments.

CONCLUSIONS

No. 1. The new counter which has been described provides for a more accurate count of bacteria by the plate count than with any other colony counter in general or accepted use.

No. 2. Pin point colonies are more readily detected and counted than when using other methods.

No. 3. The very minute, or pin point, colonies studied consisted of both the short and long chain types of streptococci which are associated with bovine mastitis.

No. 4. The method of lighting renders it easy to distinguish between fine colonies and bubbles, flakes, or other forms of debris.

No. 5. This counter provides excellent illumination, minimizes eye strain, and keeps the whole Jeffer plate under constant magnification.

REFERENCES

- ¹ Stewart, J. M. *Research*, Jan., 1906.
- ² Buck-Swenarton. *J. Lab. & Clin. Med.* 11:1095, 1925-26.
- ³ Fay, A. C. *J. Bact.*, 13:347, 1927.

* These experiments were conducted on milk during the spring of the year from dairies troubled with pin point colonies, though none of these samples showed pin point colonies in the raw milk.

VITAL STATISTICS

LOUIS I. DUBLIN, PH.D.

Tuberculosis among Infants in New York City—Recent studies and observations indicate that many infants exposed to tuberculosis develop such a high resistance to the disease that the proportion of babies dying from it is very small in comparison with those infected. Only 1.3 per cent of infants attending baby health stations reacted positively to tuberculin tests, and among those attending clinics the percentage was 4.5. This total of 3 per cent of positive reactions in these two groups is probably a more correct estimate of the incidence of tuberculous infection among infants under 2 years in New York City than the 10 to 12 per cent estimate usually accepted.

The incidence of infection varies with age, reaching its maximum between 1 and 2 years. But the percentage of deaths among infants exposed before they are 12 months of age was 50 per cent, and only 26 per cent for those exposed between 1 and 2 years. The tuberculin reactions ranged from 11.4 to 12.7 for Negro, Jewish, American and Italian babies, while for the Irish it was as high as 15.6. Although the number of positive reactions among Jewish babies was about 1 per cent higher than for Negroes, only 1.2 per cent of deaths occurred among Jewish babies, while the percentage of deaths among Negroes, 5.9, was exceeded only by the Irish, with a percentage of 7.8.

When the later condition of 405 positive infants was studied, 209, or 51.7 per cent, were found to be dead. Tuberculosis was the cause of death in 57 per cent of these cases, broncho-pneumonia caused 14 per cent and marasmus another 14 per cent of these deaths. Forty-

one per cent of those infected under 6 months were still living, 46 per cent of those infected between 6 and 12 months and 56 per cent of those infected between 12 and 24 months were also living.

No history of contact could be traced in 55 per cent of 341 infected infants but in 45 per cent it was definitely traced to tuberculosis in the family, lodgers, visiting friends or near neighbors. Of 149 infants thus exposed, 44 per cent were alive, while the majority of the deaths were due to tuberculosis. Of 187 with no history of contact, only 18 per cent were ill with tuberculosis, 82 per cent were infected but had no clinical manifestations, and only 33 per cent of the deaths were due to tuberculosis. Sixty-five per cent of 40 infants remaining at home in contact with diseased mothers died of tuberculosis while of 37 boarded out, only 2 per cent died of the disease.—M. Alice Asserson, *Am. Rev. Tuberc.*, 16:359-378 (Oct.), 1927.

Public Health in Switzerland, 1926—The federal service of public hygiene reports a large decrease in the number of cases of diphtheria, from 7,702 in 1920 to 2,617 in 1925 and 1,930 in 1926. The epidemic of smallpox, which began in 1921 and lasted about 5 years, was without a parallel in the history of smallpox in Switzerland since Jenner's discovery. In spite of the opposition to vaccination in certain parts of the country, measures were adopted which resulted in the vaccination of the majority of the population. Epidemic encephalitis and cerebrospinal meningitis were less prevalent in 1926. Puerperal fever also decreased from 30 cases in 1925 to 26 in 1926.

The number of cases of measles has increased, and in some localities the disease appears to have assumed a severer character than in former years. Scarlet fever increased from 1,980 cases in 1925 to 2,387 in 1926, especially in Berne where there were 757 cases. Poliomyelitis increased slightly from 93 cases in 1925 to 96 in 1926. An epidemic of typhoid fever in an insane hospital caused an increase from 259 cases in 1924 and 300 in 1925 to 328 in 1926. The number of cases of trachoma increased to 21 in 1926 as compared with 16 in 1925. In most instances the patients were foreigners but the authorities are making vigorous attempts to control the disease.

Toward the end of 1926, Switzerland was invaded by an epidemic of influenza which lasted for 2 or 3 months, and caused much uneasiness. During the last 2 weeks of the year 15,013 cases were reported which probably represented only a portion of the actual number prevalent.—*J. A. M. A.* 89:1796 (Nov. 19), 1927.

Cancer in Mexico—At the present time cancer is only about one-half to two-thirds as common in Mexico as in the United States, but it seems to be slowly increasing. The death rate from cancer in the whole country, although not accurately calculated, probably ranges from about 50 to 60 per 100,000 population.

Cancer is relatively common in the large cities but does not seem to be as prevalent as in the large cities of this country. The cancer death rate in Mexico City from 1922 to 1925 was about 60 while in Guadalajara, the next largest city, it was only 16 per 100,000 population. This extremely low figure suggests that there must be inaccuracy in diagnosis or in the reporting of deaths by specific causes. Vera Cruz and Merida both had rates of approximately 80 in 1925. In Oaxaca the rate was 40 and in Salina Cruz from 40 to 50. In spite of deficiencies

in reporting and inaccuracies in diagnosis, however, the conclusion is justified that cancer is relatively rare in both the native Indian and mixed-blood populations.

Cancer of the buccal cavity is more common among women than would be expected, possibly because of the great extent of the smoking habit among Mexican women. Cancers of the stomach, of relatively rare incidence, and of the liver are of about equal frequency in the sexes but cancer of the rectum and intestines is more common among women. There is a very high incidence of cancer of the female genital organs and especially of the cervix, probably because of the high fecundity of the Mexican women, but cancer of the breast is relatively infrequent. Cancer of the skin is found to an equal degree in both sexes. In general, cancer is decidedly more frequent among women than among men.

About 1 per cent of all deaths in Mexico were reported as due to cancer as compared with 5 to 10 per cent in most civilized communities. Cancer seems to occur at a relatively early period of life in Mexico, for the average age at death from cancer for both sexes was 49.8 years, or 52.9 for males and 48.7 for females in the Mexican City Hospital. The average age at death for cancer of the female genital organs was 46.6 years, and 48.9 for cancer of the breast. For both sexes combined the average age at death from cancer of the buccal cavity was 59.4 years, for cancer of the stomach and liver 54.8, for cancer of the rectum and intestines 49.9 years and 48.9 years for cancer of the skin.—Frederick L. Hoffman, *Prudential Press*, Apr. 14, 1927.

Negro Mortality in Chicago—Although Chicago in 1925 had the lowest death rate of any city of more than one million population, only Bombay and Calcutta had a higher rate than that of the negroes in Chicago. The negro death

rate of 22.5 was more than twice that of the white, and the infant mortality rate was 119 as compared with 71 for the white. The negro stillbirth rate was more than twice as great, the death rate from tuberculosis and syphilis was nearly six times as great, and from pneumonia more than three times as large as the white rates.

The death rate from pulmonary tuberculosis among negroes declined considerably between 1918 and 1921 but it has increased steadily since 1921, partly because of the large influx of negroes from the southern rural areas. The death rate from puerperal causes in 1925 was 21.8, more than twice the white rate of 9.4.

The 1920 census showed that 34.9 per cent of negro married women are gainfully employed, but there are only 4 colored day nurseries with provisions for 91 children in the whole South Side. More than one-third of the hospitals throughout the city have some restrictions on the admission of negro patients and there are very few clinics, dispensaries and infant welfare stations in the colored sections. The negroes like the Mexicans, who also have high death rates, live in the most outworn houses in the city and pay higher rents than any other class in the community. Eighty-five per cent of the negroes live in "cold water" apartments with only stoves for heat, and one-third have no toilets in their apartments.—H. L. Harris, Jr., *Social Serv. Rev.*, 1:58-77 (Mar.), 1927.

Cancer in Massachusetts—In 1920-1923 the cancer death rate in Massachusetts, adjusted for age and sex distribution, was the highest of any state in the Union. New York, Rhode Island and Connecticut, all with a high concentration of urban population and many foreign born inhabitants, ranked next in order. A comparison of the adjusted death rates in communities of different densities showed a steady increase from

86.3 in communities with a density of less than 50, to 131.4 in communities with more than 3,000 persons per square mile. This apparent relation between increasing death rates and greater densities, however, is not found among the native born of native parents, and seems to be due to the fact that the percentage of foreign born population increases steadily with the density. The foreign born is an older group than the others and most individuals born in foreign countries have a high death rate from cancer, varying from 84 for those born in Italy to 323 for those from Ireland in Massachusetts 1921-1925.

A small part of the relation between high death rate and greater density may also be due to the fact that there is more accurate diagnosis of cancer in the cities because of better diagnostic facilities.—Herbert L. Lombard and Carl R. Doering. *Proc. Nat. Acad. Sci.*, 13:728-735 (Oct.), 1927.

The After-History of Sanatorium-Treated Patients—The after-history of 384 patients treated in the last half of 1922 in the King George V Sanatorium was traced as far as possible in 1926. Only cases in which the diagnosis of pulmonary tuberculosis was confirmed were included. This study seems to indicate that the age of the patients, records of temperatures and hemorrhages had little value in giving the prognosis of any case of pulmonary tuberculosis.

In 1914 and 1915, 70 per cent of all cases treated in sanatoria were dead within 4 years but only 35 per cent of the 384 patients studied in 1926 had died in the same period. Twenty per cent of them were either doing or were capable of doing full or ordinary work, 9 per cent were in some new occupation, usually a lighter or more suitable one, 24 per cent were unfit to work, 4 per cent were undergoing further institutional treatment and 7 per cent were untraced. Among the 48 cases discharged as quies-

cent 8 per cent had died and 58 per cent were at work of some kind, 32 per cent of the 148 discharged as much improved were dead and only 28 per cent at work, 24 per cent of the 116 early cases discharged as much improved had died and 30 per cent were working, 64 per cent of the late cases discharged as much improved had died and only 19 per cent were able to work. Twenty-one per cent of the 103 cases discharged as fit for full work were dead, 29 per cent at full or ordinary work, and 15 per cent doing lighter work, of the 118 discharged as fit for light work, 36 per cent were dead, 16 per cent doing full or ordinary work, and 8 per cent at more suitable work, 62 per cent of the 99 discharged as unfit for work were dead, 9 were doing full work, and 1 per cent were at more suitable work.

The percentage of deaths varied from 42 per cent of the patients between 16 and 25, to 40 per cent of those over 25 and under 40, and 35 per cent of those over 40. In the first age period 25 per cent were at work of some kind, 28 per cent of the second age group and 25 per cent of the third age group were at work.—C. O. S. Blyth Brooke. *Med. Off.*, 38: 163-165 (Oct. 8), 1927.

The Incidence of Infectious Diseases in Italy in 1926—The *Bollettino delle malattie infettive* contains the official report for the year 1926 on the incidence of infectious diseases, in comparison with the previous year. Almost all infectious diseases show a decrease in the number of cases, over that of 1925. The exceptions are influenza, typhoid and paratyphoid, and pertussis. The principal figures are as follows: measles,

98,155 cases in 1926, as against 164,485 in 1925; scarlet fever, 16,062 cases in 1926 and 16,733 in 1925; typhoid, 35,649 cases in 1926 and 24,264 in 1925; paratyphoid infections, 6,711 cases as against 5,036; influenza, 184,499 cases in 1926 and 64,736 in 1925; diphtheria, 14,923 cases in 1926, as compared with 15,383 in 1925; pertussis, 31,282 cases in contrast with 23,756 for the previous year; epidemic encephalitis, 450, as against 681, and malaria, 220,602 in 1926 and 283,109 in 1925. There were, in addition in 1926, 34 cases of exanthematic typhus, 31 of which developed in Naples, being due to imported food products. There were no cases reported of Asiatic cholera, plague or yellow fever.—*J. A. M. A.* 89:1797 (Nov. 19), 1927.

Heart Disease in the South—The relatively low incidence of acute rheumatic fever and chorea and the large negro population in the South give a different aspect to the problem from that of the East and the North. The study of 915 patients with heart disease in Galveston, Tex., shows that the incidence of heart disease in negroes is 1.8 times as great as in the white race. Impairment of renal function occurred in one-third of all the cases of heart disease.

Of the 915 patients, 47.7 per cent were hypertensive, 19.3 per cent syphilitic, 13.7 per cent arterio-sclerotic, 7.3 per cent rheumatic, 2.3 per cent had angina pectoris, 1.5 per cent showed subacute bacterial endocarditis, 1.3 per cent were thyrotoxic, 0.7 per cent had congenital heart disease.—Charles T. Stone and Francis R. Vanzant. *J. A. M. A.*, 89: 1473-1477 (Oct. 29), 1927.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C.E.

BOARD OF PUBLIC HEALTH ENGINEERS OF OHIO RIVER BASIN

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WHAT is believed to be the first "de-facto" river board in the United States was created by a formal action of the commissioners of the health departments of the States of Pennsylvania, Ohio, West Virginia, Kentucky, New York, Maryland, Indiana, Illinois and Tennessee, at a meeting which they held in Cincinnati on October 18, 1927.

In 1924, the health departments of Pennsylvania, Ohio and West Virginia, entered into an Inter-State Stream Conservation Agreement, which provided for coöperation between these departments for the abatement of pollution in one state harmful to public interests in the adjacent or downstream state.

Under this agreement the Health Departments of Ohio and West Virginia caused to be brought about at by-product coke ovens within their jurisdiction, the installation of works to prevent discharge of phenolic substances affecting water works intakes in Pennsylvania on the Beaver and Monongahela Rivers, which resulted in relief from offensive tastes and odors in those water supplies.

Prior to the making of this agreement, such steps had already been taken by the Pennsylvania by-product coke ovens on the watershed of the Ohio River, with one exception, and through efforts of the Pennsylvania Department of Health, works are about to be installed at that one remaining plant.

Later the Kentucky Department of

Health became a supplemental party to this inter-state agreement because of its evident benefits, as did subsequently, the remaining states as above enumerated.

The commissioners of health, parties to this agreement, in the latter part of 1926, appointed their chief engineers to constitute a board charged with the duty of recommending to the commissioners, policies and *modus operandi* to render the agreement effective.

At the meeting of the commissioners in Cincinnati they adopted the following resolution:

WHEREAS, it is necessary to adopt certain policies and procedures in order effectively and efficiently to carry out the letter and the spirit of coöperation and conscience upon which the Ohio River Interstate Stream Conservation Agreement is founded, therefore be it

RESOLVED, that the following policies and procedures be adopted as part of the said agreement.

1. The chief engineers of the Departments of Health, signators to the Ohio River Interstate Stream Conservation Agreement, shall constitute the "Board of Public Health Engineers of Ohio River Basin" hereinafter referred to as the board.
2. The board shall meet at least annually, during the first week of December and shall recommend, from time to time as may be deemed necessary, to the health commissioners, signators to the agreement, ways and means for effectively and efficiently carrying out the letter and the spirit of the agreement.
3. As adequate protection of public water supplies from damage caused by phenol and other tarry acids discharged into the source

of such supplies requires substantially complete and continuous elimination of the discharge of wastes containing such constituents, or substantially complete and continuous removal of such constituents prior to discharge, therefore the signators of the agreement should institute action promptly to require such elimination or removal by suitable treatment prior to discharge.

4. The signators to the agreement will notify promptly downstream or adjacent signators of unusual events affecting the Ohio River or its tributaries, such as phenol spills, typhoid fever epidemics, etc., in order that suitable measures may be taken by such downstream or adjacent signators to the agreement as are needful to protect the public health.
5. The signators to the agreement, in matters relevant thereto will coordinate present and proposed research, exchange data derived therefrom and exchange ideas on administrative policies for mutual benefit.
6. The signators to the agreement will furnish to downstream or adjacent signators data concerning discharge of sewage or industrial wastes or the treatment thereof in cases where such matters might prejudicially affect such signators in order to obtain thereby the views and judgment of such downstream or adjacent signators.
7. Any signator to the agreement invoking the provisions thereof for abatement of alleged

harmful pollution first shall establish the fact that the cause of the alleged harmful pollution does not exist within its own jurisdiction but does exist within the jurisdiction of the upstream or adjacent state.

8. The signators to the agreement in matters involving mutual concern will arrange for joint inspections of water works, alleged pollution of interstate streams, the alleged effects thereof, the stream involved therein, proposed remedies, and reports thereon whenever deemed necessary.

The commissioners of health parties to the agreement are as follows: Theodore B. Appel, M.D., Secretary of Health, Pennsylvania; John E. Monger, M.D., Director of Health, Ohio; W. T. Henshaw, M.D., Commissioner of Health, West Virginia; A. T. McCormack, M.D., State Health Officer, Kentucky; Matthias Nicoll, Jr., M.D., Commissioner of Health, New York; John S. Fulton, M.D., Director of Health, Maryland; Isaac D. Rawlings, M. D., Director of Public Health, Illinois; Wm. F. King, M.D., State Health Commissioner, Indiana; E. L. Bishop, M.D., Commissioner of Health, Tennessee.

The members of the Board of Engineers are as follows: W. L. Stevenson, Chairman, Pennsylvania; F. H. Waring, Secretary, Ohio; E. S. Tisdale, West Virginia; F. C. Dugan, Kentucky; C. A. Holmquist, New York; Abel Wolman, Maryland; H. F. Ferguson, Illinois; L. S. Finch, Indiana; H. R. Fullerton, Tennessee.

School Ventilation Laws—This very brief paper provides certain basic principles which the New York State Commission on Ventilation have formulated in response to requests for suggestions as to the matter which should be included in school ventilation laws. The requirements for heating and ventilation are essentially the following: (1) The provision of sufficient heating capacity to heat (a) corridors, gymnasiums and shops to 65°; (b) swimming pools and dressing rooms to 75°; (c) all other occupied rooms to 68°; (2) all classrooms shall have at least 15 sq. ft. of floor space per pupil and shall have a system of ventilation capable of avoiding the production of unpleasant odors usually associated with more than 15 parts of carbon dioxide per 10,000, and ca-

pable of functioning without producing chilling drafts. Such ventilation shall be accomplished by either window-gravity or mechanical means or by any other method which will attain the desired result. Ventilation of auditoria, chemical laboratories, shops, etc., shall be obtained preferably by mechanical means; (3) every schoolroom shall be provided with at least one thermometer; (4) an approved system of ventilation shall be maintained in operation whenever school is in session.—Thomas J. Duffield. *J. Am. Soc. Heat. & Vent. Engrs.*, 33:388 (June), 1927. Abstr. Leonard Greenburg.

Food Poisoning by Rats—The matter of food poisoning by rats is still an important problem. Meyer and Matsu-

mura of the California Hooper Foundation for Medical Research found approximately 8 per cent of the rats examined infected with one or two transmissible bacterial diseases, 2 per cent shedding virulent types capable of infecting food and further that 6 per cent near slaughterhouses and retail merchants could do this.

Feces were added to food of kittens and tame rats and four rat-borne diseases were produced—hemorrhagic septicemia, plague, rat typhoid and pseudotuberculosis. The first, being similar to plague, has complicated the campaigns against it, but now that the specific organism has been located and classified, the disease can be definitely diagnosed.

If conditions exist as these observers picture them, it is high time that a very definite program for eradication of the rat be instituted for there are worse conditions than these men found.—Anon. *Hygeia*, 5:14 (June), 1927. Abstr. H. D. Cashmore.

A New Means of Combating Anopheles in Italy: An Account of the Acclimatization and Progress of Gambusia—The author gives a review of the value of indigenous fish as eradicators of mosquito larvae and concludes: "For my part I am perfectly convinced that there do not exist any fishes of our own country (or probably in Southern Europe) which can be employed efficaciously in the antimalaria fight." Then reference is made to the arrival of "some hundreds" of gambusia in 1921 at Madrid, Spain, which had been shipped from the United States (U. S. Fisheries Station, Edenton). The fish were placed in a pond near Madrid and a year later this pond and the communicating streams were "crowded" with gambusia. Two or three hundred were then transferred to Italy, arriving in Rome in 1922. These fish were divided into four lots. They multiplied rapidly and the following April the effects be-

came evident, for "the Lago di Porto which had been swarming with mosquito larvae in previous years, now only rarely presented a specimen."

Gambusia multiplied and invaded canals and other waters. It is reported that they have been liberally distributed over many parts of Italy, and they have been introduced from Italy, directly or indirectly, into Germany, Russia and Jugoslavia. The opinion is expressed that gambusia multiply more rapidly in Italy than in the place of their origin, namely, the United States.

The author says, "After four and three years, respectively, from the time of importation of gambusia into Spain and into Italy we have to thank the United States for the precious gift which they have made us, the value of which we no longer doubt." The conclusions are that complete mosquito control is obtainable, if there is complete control of vegetation. Vertical vegetation leaves to gambusia the possibility of complete destruction. Horizontal vegetation often prevents complete control. The relative degree of control in the presence of such vegetation, however, depends on the number of fish present. In some extensive zones not a drop of petroleum has been used, yet, the mosquitoes have been reduced to a minimum this year (1925), something never before obtained.

A reduction in malaria incidence also is reported. The author concludes: "The results of this initial period warrant, therefore, the affirmation that in gambusia, Italy acquired a new means for the reduction of the larvae of the anopheles." Maximus Sells. *Rendu Du Premier Congres International Du Paludisme*, Rome, 1926. 16 pp. Abstr. S. F. Hildebrand.

Burning Gas from Imhoff Tanks at Decatur, Ill.—Due to the strength and high temperature of the Decatur sewage, bacterial decomposition and putrefaction take place rapidly in the

sewers and in the Imhoff tank, producing large quantities of odorous gases. A collecting arrangement has been provided by means of which about 100,000 cu. ft. of gas per day is now caught, having a heat value of 700 B.T.U. per cu. ft. By burning this gas, the odor nuisance about the treatment plant was immediately reduced. Details are given regarding the composition of the gas under different conditions. William D. Hatfield. *Water Works*, 66:99 (Mar.), 1927. Abstr. D. E. Kepner.

Disposal of Trade Sewage—The writer points out the importance of proper disposal of trade sewage, indicating that this phase of sanitation is becoming more and more necessary. One of the most serious problems in trade waste sewages is the nature and concentration of these wastes. Until recently little has been known of the various chemical and biological activities taking place in trade wastes, but more lately continued study of the different lines of this work has shown that each trade sewage presents an individual problem in itself.

Three general ways of handling trade sewage are: (1) By fine screening, followed by sufficient dilution to prevent undue stream pollution; (2) partial treatment to destroy acid forming bacteria or to so change the trade sewage as to make it equivalent to ordinary domestic sewage thereby permitting it to be run into the municipal sewer system; (3) complete treatment of trade sewage so that the effluent can be wasted into any stream or storm sewer.

The writer devotes some space to pointing out the fact that it is ill advised to force a part-time industry to spend so much on trade sewage treatment as to cause that industry to either abandon its work or to move to another locality.

Study of each particular problem will probably reveal methods of treating wastes which will be economically pos-

sible. For example, a particular sugar beet company experimented with trickling beds of stone for producing a stable effluent. One of the materials used in the beds was crushed granite, the cost for which for a complete plant would have been \$90,000, and another material was cinders, the similar cost for which would have been only \$20,000. If the cinders prove to be as satisfactory as granite and also answer the other requirements there will be saved, approximately, \$70,000. C. H. Currie. *Munic. & County Eng.*, 72:249 (May), 1927.

A Texas Water Supply Enlargement Problem Involving a Dual Distribution System—The question of the advisability of distributing water to a community by a dual system may arise in certain parts of this country, particularly in the southwest where large quantities of water are used for irrigation purposes.

Wichita Falls, Tex., is cited as a city where the relative economy of dual systems will probably have to be considered seriously as the city grows. Lake Wichita, the source of the present water supply, could furnish a satisfactory soft water for domestic purposes in the future provided another source of supply, possibly Lake Kemp, which furnishes water which is saline and very hard, might be utilized for irrigation and fire fighting purposes.

The relative costs on single and dual systems are set forth in the article and following conclusions drawn: (1) Dual systems are more expensive in first cost and in operation than single systems due to duplication of pipe lines, services, pumping plant and accessories; (2) some unusual situation such as the inadequacy of a suitable water supply together with an unusually high cost for an additional supply or excess treatment costs must exist before a dual supply can be economical. N. T. Veatch, Jr. *Proc. Ninth Texas Water Works Short School*,

Jan. 24-29, 1927. Pp. 59-63. Abstr. E. S. Tisdale.

Recent Improvements and Criticisms of Imhoff Tanks—The upper part of the sedimentation chamber should be given the largest surface area because depths of over 6 feet cannot be included in the computation of the detention period. One hour detention period is enough, but longer periods may be desirable, especially when contact aerators will be provided for. The sludge digestion chamber should be as deep as possible but should have a minimum of water surface.

Gas traps should be built in all large Imhoff tank installations. The construction costs are very slight as the already present slant partition walls for the separation of the sedimentation chamber from the sludge digestion chamber serve as gas retainers. The amount of gas is about 8 litres per head per day which can be increased at higher temperature to threefold. Imhoff tanks whose septic chambers have become too small may be provided with secondary sludge digestion tanks into which the half-digested sludge can be pumped. In the meantime the sludge from the secondary tank is allowed to return into the Imhoff tank. In winter there is the additional advantage that the cold separate sludge digestion chamber is heated by the warm Imhoff sludge. Contact aerators (that is to say, submerged structures into which air is supplied from below), have to date proved themselves very economical. The disadvantages of Imhoff tanks as compared with the single story sludge digestion tanks are briefly as follows: Construction is deeper, foaming during the ripening period or later damages the stabilization, and it is impossible to artificially heat the septic chamber. Among the advantages are: the automatic con-

tinuous flow of sludge from sedimentation chambers, the even distribution of fresh sludge into septic chambers, the septic chambers are naturally kept warm by the flowing effluent, the installation of gas traps are cheaper owing to the presence of slanted partitions, the relatively small amount of CO₂ in the gas and the simplicity of operation. Karl Imhoff. *Proc. Ninth Texas Water Works Short School*, Jan. 24-29, 1927, pp. 369-371. Abstr. H. H. Rashid.

Bacterial Efficiency of Mechanical Gravity Filters—The investigation was carried on to determine the bacterial efficiency of filters independent of the other devices usually associated with this type of plant.

The plants studied comprised 14 Paterson gravity type filters, 4 Jewell gravity filters and 6 Mather and Platt type filters, all taking water from the Ganges within a distance of 15 miles. The only variable factor in so far as the raw water was concerned was the bacterial pollution. The water in every case, after a varying dosage of alum, was given a short period of sedimentation. The efficiency of the filters was determined by the *B. coli* removal. The investigation was continued through two years. The summary of results from each of the eight plants studied is given. In general 75 per cent of the samples showed a 90 per cent removal of *B. coli*.

The writer points out that, where chlorination is not depended upon, the preliminary treatment devices should be so designed as to allow for the water to be delivered to the filters with a bacterial content such as to permit the filters to deliver a uniformly satisfactory water. Rao Sahib V. Govinda Raju. *Indian J. M. Research*, 14:707 (Jan.), 1927. Abstr. R. E. Tarbett.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M.D., AND LEONARD GREENBURG, PH.D.

The Psychoneurotic Worker—It is quite common that when one undertakes a research for some definite purpose the by-products of this research are as valuable, if not more valuable, than the particular information anticipated. In a study of telegraphists' cramp, made under the auspices of the Industrial Fatigue Research Board of Great Britain, the following claims of interest to industry were made. From an examination of 100 learners the investigators found that it was possible at the age of 16 to differentiate the psychoneurotic workers from the normal. They also found from studying additional groups of workers that approximately 20 per cent possessed personalities which are liable to "nervous breakdown"; and that certain occupations, one of which is telegraphy, tend more than other occupations to help make for an increase of symptoms.—May Smith and Eric Farmer, *A Study of Telegraphists' Cramp, Report No. 43*, Industrial Fatigue Research Board, London, 1927. *Human Factor*, 3:11 (July-Oct.), 1927.

Fifty Years of Legislation on Occupational Diseases in Switzerland—During the last forty or fifty years the principle of occupational risk has been successively adopted by the legislative systems of almost all countries. While this applies to accidents, in most countries no compensation is payable for industrial poisons or infections. The experience of Switzerland, the first country to adopt occupational disease legislation, now covers half a century. Its principle was first applied to the manufacture of matches with white phosphorus and the use of Jacquard looms with lead weights.

An historical survey shows that the schedule method was early adopted, in 1901, 34 disease hazards being listed. In September, 1920, the list was extended to over 100 disease causes, principally poisonous substances. (The article discusses at some length the legal provisions adopted in regard to occupational diseases in Switzerland.)—Dr. Werner Lauber, *Internat. Labour Rev.*, 16:472-486 (Oct.), 1927.

Carbon Monoxide Tests in Commercial Garages and Automobile Repair Shops—The Sayers-Yant method of estimating very small quantities of carbon monoxide in the atmosphere was selected because:

It is the best combination of sensitivity, portability and time economy. It will give a distinctly positive test with concentrations as low as 1 part in 10,000; a brief case will hold the apparatus for taking twelve samples; and the analysis of the twelve samples can be completed in the laboratory with the help of an equilibrator in three or four hours.

The average of all carbon monoxide tests was 0.9 parts per 10,000, i.e., less than 1 part per 10,000. The average for repair shops was 1.1 parts per 10,000; for rooms in which small repairs were made incidental to the storage of automobiles, the average was 0.6 parts per 10,000; and in commercial garages storing 5 or more cars the average was 0.9 parts per 10,000.

It is clear that the average condition is not deplorable, although 1 part per 10,000 is just about the maximum that should be tolerated in a room where there is an eight-hour exposure to the gas.

Many of the garage proprietors reported that employes complained of headaches which they believed were caused by the gas; but there were only a few places where the condition became so pronounced that employes had to leave their work.

In almost every case where an excessive amount of carbon monoxide was found, there

was also a distinctly visible smoke cloud and also a strong odor noticeable upon first entering the room.

Mechanical ventilation was almost unknown in the shops covered—only one exhaust system in all of the 71 shops. Five had small propeller fans installed in windows. A few of the shops were equipped with flexible pipes which were slipped over the end of the exhaust pipe to conduct the noxious gases outside the building. This system gave good results when used but, of course, is not effective in large commercial garages where machines are in motion. Two illustrations and three tables accompany the article. —Carroll M. Salls, *Indust. Hyg. Bull.*, N. Y. State Dept. of Labor, 4, 5:17–20 (Nov.), 1927.

Tuberculosis in Relation to Housing and Industrial Conditions—Whether tuberculosis in the adult represents the awakening of an infection acquired during, but latent since, childhood, or a new infection, is under dispute. Sure and certain knowledge concerning tuberculosis is not extensive. It may be summed up in two statements:

1. Tuberculosis is an infection.
2. This infection is acquired during life.

In this country, during the war period, the rise in tuberculosis mortality was confined to the ages 15 to 30 years, was particularly investigated for women, and shown to be in direct proportion to the extent they were called upon to perform munition work. The evidence is conclusive that nutrition, or rather malnutrition, is a factor ruling mortality from the disease in early adult life. In spite of the fact that following the war inadequate housing was at its height, a decided fall in the mortality has occurred and the trend of the pre-war fall has been resumed. The fall, just as occurred in the 50 years or so previous to the war, was coincident with a rise in the value of real wages. Apparently unhygienic environment is of far less importance than mal-

nutrition, so far as tuberculosis is concerned.

Heavy work on entering industry and low pay, which represents an inadequate dietary, predispose to the disease in early adult life. Industrial life for most females terminates with marriage, but for males it continues throughout life. Any difference, then, which exists between the mortality from tuberculosis of males in middle life and that of females, may reasonably be ascribed to industrial conditions. The difference is well known to be pronounced and to be far more pronounced in industrial districts than in rural areas. Today the stronghold of tuberculosis, when estimated by the mortality from phthisis at age periods per 1,000 living, is found among males of middle age in industrial districts; but mortality at this period of life may reasonably be held to represent the cumulative effect of industrial life as lived during the last 30 years. The effect of shorter hours of work, customary today, will only become manifest as years pass.

The factor of infection is found dominating the predisposing factors of malnutrition and wear-and-tear, which can only act by modifying the power of resistance to infection. The wear-and-tear factor—silicotic fibrosis—in the Rand Gold Mines is so specific and intense, that it might sociologically have been expected to dominate the infection factor; but it has been found absolutely necessary, in order to bring the occupational risk under control, to minimize and, if possible, eliminate tuberculosis infection from the industry. Through periodical reexamination every 6 months of all European labor, excellent results are being obtained, and, when native labor is as strictly supervised as European, the industry will be freed from its scourge. *Control of an infectious disease can only be acquired by controlling exposure to infection.*

The conclusion presented is that the amount of tuberculosis infection has

been diminishing; it may still be ubiquitous, but it is less intensive. We must recognize the tubercle carrier, just as we do the typhoid carrier, and, although we adopt every means to maintain a stronger resistance, we must eliminate the infected from our factory industries and place them in industrial colonies.—Edgar L. Collis, *Med. Off.*, Aug. 6, 1927, pp. 59–61.

The Trend of Occupational Mortality in the United States—The compilation of mortality rates by industry is a difficult if not an impossible task, so far as American vital statistics are concerned. Dr. Pedley in this paper presents a consideration of the statistics of the City of New York for the year 1924 of the Metropolitan Life Insurance Company and of the United States Census Bureau, classified not according to occupation, but for occupied persons by various causes of death. Instead of attempting to arrive at mortality rates Dr. Pedley uses the proportionate mortality method for estimating the severity of the various diseases. That proportionate mortality data is open to certain criticisms and possesses certain fallacies is well known to statisticians, and Dr. Pedley is fully cognizant of the limitations of his data in this respect.

From this data it is obvious that tuberculosis is still excessive in industry as contrasted with the country as a whole, but cardiac diseases have deposed tuberculosis from its position of first prominence.

Dr. Pedley further points out the very interesting fact that the relative proportion of cancer among occupied persons is actually less than among unoccupied persons. It is true that this may in some measure be brought about by the listing on the death certificates. The increase in proportionate mortality from cancer among occupied persons from the year 1909 to 1923 is no greater than that

among the general population.—Frank G. Pedley, *J. Indust. Hyg.*, 9, 11:475. (Nov.), 1927. L. G.

Report of a Case of Injury to the Skin and Eyes by Liquid Sulphur Dioxide—This brief paper presents the review of a case of a workman who, while attempting to open a valve on a tank containing sulphur dioxide broke the pipe leading to the tank, thereby permitting this substance to cover certain parts of his head and body. Very little injury was inflicted upon the parts of his body which were covered by clothing, but his eyes and face were rather severely injured. Considerable edema of the eyelids with blistering of the skin was present over most of the face. The cornea of the right eye was almost completely denuded of epithelium and there was marked conjunctival injection and chemosis present. Treatment consisted of boric acid wash, atropine and oil installations. After 5 weeks, vision in each

eye was $\frac{20}{100}$ and after 4 months, the vision was $\frac{20}{20}$.

The author's observations

in this case lead him to believe that the ill effects of exposure to liquid sulphur dioxide are due to a rapid freezing of the tissues and not to any escharotic action.—B. R. Kennon, *J. Inst. Hyg.*, 9, 11: 486. (Nov.), 1927. L. G.

Pulmonary Asbestosis in its Clinical Aspects—Sir Thomas Oliver points out that with two exceptions, so far as he is aware, there has not been anything written on the subject of pulmonary asbestosis in Great Britain. He therefore takes this opportunity to present the histories of two females whom he examined and found to be suffering from this disease. The first patient, age 48, was forced to give up work on account of increased physical debility and shortness of breath. Her lungs showed ab-

normal breathing sounds and the presence of moist, tinkling sounds suggestive of cavitation. The respiratory capacity was found to be 1 inch. The apex beat was felt external to the nipple, which finding, considered along with the marked accentuation of the second sound of the heart over the pulmonary artery suggests to Dr. Oliver that fibrotic changes have already taken place in the lung.

The second patient, age 39, an asbestos worker for 18 years, developed a cough and bronchial asthma, and finally stopped work because of the loss of considerable weight in the early months of a pregnancy. The cough persisted throughout this time, but the infant daughter who is now 14 months old was found to be healthy and well developed. There is a noticeable shortness of breath on slight exertion and the presence of morning cough with expectoration. The heart is normal, but the second sound over the pulmonary artery is distinctly accentuated and moist rales were found at the base of the lungs.

In both cases the sputum was found to be negative for tubercle bacillus. The disease resembles silicosis in pronounced shortness of breath on slight exertion and deficient respiratory capacity.—Sir Thomas Oliver. *J. Indust. Hyg.*, 9, 11: 483. (Nov.), 1927. L. G.

Mental Hygiene in Business—We all promptly recognize the following types of children: the bashful, recluse, sensitive little fellow; the boastful, bullying sort who makes life miserable for his playmates; the deceitful boy; the boy with the uncontrolled temper; the youngster who pulls the cat's tail when no one is looking; the misfit who seems to have the faculty of always doing the wrong thing and being more or less constantly in difficulties; and so we might continue with a great number of well recognized types of personalities. Too well we know these same children in later life.

These are problems in human behavior; they are personality problems; they are problems in the adaptation of the individual to his everyday environment; they are problems for mental hygiene.

We have no argument with the principles of physical hygiene which have contributed so much to the well-being and longevity of our generation; education, moderation, cleanliness, regularity are the cornerstones. The development of mental hygiene has proceeded quietly, logically and effectively until it has become an integral part of the fabric of our everyday educational, social, political and business life.

Is it not incumbent on the leaders of industry to acquaint themselves with and make use of the principles and practices of mental hygiene?—Abstract of remarks by Dr. Quinby before the Executive Committee of the Associated Industries of Massachusetts. *Industry*, XIX, 10 (May 7), 1927: (Quoted from *The Human Factor*, 3:11 (July-Oct.), 1927.

The Medical Inspection of Factories—Commenting upon the condensed report of the conference held at Düsseldorf in 1926, published by the International Labour Office, the *Medical Officer* says:

Sir Thomas Legge, who represented Great Britain, gave an excellent report of the state of medical inspection of factories in Britain, which has the oldest scheme in existence and which has not been altered materially since 1844. Sir Thomas sees the necessity for a revision, and briefly indicated along what lines he considers such reconstruction should proceed. We have elsewhere shown dissent from many of Sir Thomas's ideals, but here we are concerned not with details, but with the broad basis of factory medical inspection, about which there is no difference of opinion amongst experts, as is shown by the resolutions of the conference being carried unanimously.

These resolutions are as follows:

Principles which should govern the organization of medical factory inspection in all countries:

1. The broadest freedom of access to all

places where work is done. Freedom of investigation of all kinds: questioning, examination of the personnel, taking of samples, etc.

2. The privilege of free expression of opinion to responsible authorities without submission to the censorship of non-medical intermediary authorities.

3. Compulsory consultation of medical inspectors by all constituted authorities on all questions concerning the health of the worker as such.

ADMINISTRATIVE POSITION

1. It is desirable that medical inspectors form an organization independent of other similar administrative organizations.

2. Medical inspectors should exercise sufficient authority to ensure compliance with regulations affecting the health of the worker as such.

3. It is the duty of the medical inspector to make proposals for regulations specially connected with the personal hygiene of the worker as such directly, and not through any other official.

4. Rules should be drawn up for the coöperation of medical inspectors with other officials appointed to supervise industrial establishments of any kind.

5. This coöperation should be based on the fundamental principles of administrative equality of the different organizations taking part in factory inspection.

We draw attention to Nos. 1 and 3 of the administrative position. To make No. 3 effective, coöperation with general public health administration is essential, and this could not be done without some modification of No. 1. The main idea before the conference was to divorce medical from other inspectorial duties. Nothing, in our opinion, would render this more feasible and acceptable than transference of the medical inspectorate of factories from the Home Office to the Ministry of Health in this country and

its inclusion in the general organization of the nation. Sir Thomas Legge suggests certain objections to this, but we submit that his objections result from a misconception, and that if ever we get down to consider the matter as a practical proposition, he will see his way to withdraw any opposition he may put forward.

The medical inspection of labour seems to us to resolve itself into three distinct but closely connected factors: that of the factory itself; that of the personal environment of the workers in the factory, and that of the outside environment and private hygiene of the worker. In the last category, it might be stated, as an example, that though bad housing conditions are always detrimental they cause far less serious trouble to agricultural labourers than they do to mill operatives. In fact, the inspection of factories and of factory workers as factories workers cannot well be separated from the general medical supervision of the workers as citizens, though it is undoubtedly a special department, requiring of its practitioners specialized training and experience.

The last passage of the report of Professor Holtzmann of Baden is noteworthy:

"Emphasis is to be laid on the importance of the medical inspector's duties as an instructor in the Technical High School. Young engineers, engaged in acquiring practical experience, are enabled in this way to obtain a knowledge of industrial hygiene necessary for their duties.

"The little brochure is replete with interesting observations and the whole forms a very good epitome of modern factory practice."—*Med. Off.*, Oct. 22, 1927, pp. 183–184.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Nutritive Properties of the Mung Bean—The mung bean, grown throughout southern Asia as well as other tropical countries, is the principal constituent, either dried or germinated, of chop suey, and preliminary experiments indicate that it can be grown in certain semi-arid sections of the United States. The beans used in experimental feeding were the solid green seed which contained 23.31 per cent protein and 9.31 per cent moisture. The protein content was further studied showing the amino acids and their distribution.

On a ration containing 60 per cent of the bean, representing approximately 14 per cent protein supplemented by sodium chloride and calcium carbonate made up with dextrin to 100 parts, rats were enabled to grow to maturity and to reproduce young, many of which were weaned. The growth, however, is somewhat below normal and reproduction limited.

A second set of experiments was conducted using the optimum protein level to investigate the vitamin content of the seeds, and a third experiment was carried out to determine whether there was a deficiency other than that of sodium, calcium and chlorine. Vitamin A was found to be present in amounts necessary for normal growth, indicating the superiority of this bean in that respect to most seeds. Vitamin B is present in sufficient amounts when the bean composes 60 per cent of the ration. It was found that the addition of sodium, calcium and chlorine completed the mineral requirements. To determine the effect of cooking, beans were autoclaved at 15 pounds pressure for 1, 2 and 3 hours, then dried and fed, vitamin A being added in all cases. Heating for 1 hour indicated a

slight improvement, but the seeds heated for 3 hours were decreased in nutritive value of the protein. It is concluded that the mung is a superior type of bean nutritively but not adequate as a sole source of protein.—V. G. Heller, *J. Biol. Chem.* 75:435 (Nov.), 1927.

Zinc and Normal Nutrition—Various plant and animal substances were examined to determine the zinc content corroborating the previously reported widespread presence of zinc. Feeding experiments were conducted on white mice, applying a standard basal diet for control. This basal diet was varied to exclude so far as possible zinc, and was later supplemented by known amounts of zinc, 0.02 mg. per mouse per day in one group, and 0.04 mg. per mouse per day in the second. In each case the zinc was added as a solution of the sulfate. Laboratory-bred mice, uniform in weight, were used for experiments and so far as possible comparison made within litters. Tables are given showing the rate of growth of the various groups over 20, 45- and 70-day periods after the mice had reached 10 gm. of body weight. It was found that there was a retardation of growth when the animals were fed on the zinc-low diet. The addition of 0.02 mg. zinc per mouse per day resulted in a stimulation in growth as compared with the zinc-low diet. With the larger amount, 0.04 mg. per mouse per day, the same stimulation and growth was not found, and there was more irregularity than in other groups. Comparing the zinc diet with the control diet, it was found that while there was some stimulation, it would not alone restore the food mixture to the level of the control.

In addition to the growth experiments, an examination was made of the zinc content of animals at various ages on the stock diet and of animals at the age of 70 days after reaching 10 gm. body weight, in the experimental diets. The analysis indicated that the animals on the zinc-low diet had a distinctly lower zinc content than those on the control diet. Animals fed 0.02 mg. per mouse per day showed a zinc content somewhat above the animals on the zinc-low diet. With the feeding of the larger amount of zinc, the amount retained was increased for the males, but not for the females. In both the zinc fed groups, the zinc content was comparable to that of the control and those on the stock diet. There is apparently no storage of zinc to any extent in the growing animals. It is concluded that while the addition of a small amount of zinc may cause a slight stimulation in growth, the addition of zinc alone to a food mixture low in the metal is not sufficient to equalize this diet to standard, probably due to the fact that the value of the zinc cannot be ascribed to the metal itself but that it is associated in function with other metals present in small amounts.—Rebecca B. Hubbell and Lafayette B. Mendel, *J. Biol. Chem.* 75:567 (Nov.), 1927.

Feeding Experiments With Plants at Different Stages of Development—III. Synthesis of Vitamin in Plants—In this continuation of the study previously noted (E. S. R. 53:766), ungerminated, germinated, and green corn were compared as to content of vitamin A by using an equal number of seeds instead of equal weights of the three materials. One group of five rats whose weight had become stationary on a diet deficient in vitamin A was given 6 seeds of ungerminated corn per rat per day in addition to the basal diet, another group of five received the equivalent of 6 seeds of germinated corn, and a third group the green seedlings. Within 81 days all

of the rats in the first two groups had contracted xerophthalmia and eight had died, while all of the rats in the third group were in excellent condition and were gaining in weight. This is thought to indicate a synthesis of vitamin A during the development of the green color.—M. Karshan, F. Krasnow, and B. Harrow. *Soc. Exper. Biol. & Med. Proc.* 24: 765, 1927. Abstract, *Exper. Sta. Rec.*, 57:789, (Dec.), 1927.

Food Poisoning—The Malcolm Morris Memorial Lecture was delivered by Dr. W. G. Savage who discussed the subject of food poisoning. The simplest type is that caused by the consumption of a definitely poisoned plant or animal such as, for example, mushrooms, or apples sprayed with arsenicals. In 1922, 200 people were poisoned by apples which had been cooked for hours in a zinc container. Another instance of poisoning was caused by the contamination of sage used for stuffing, with belladonna leaves. These outbreaks, however, represent a very small proportion of all poisoning, most of which is caused by bacteria. Dr. Savage pointed out that ptomaine poisoning is a misnomer. While chemists have been able to extract toxic ptomaines from decomposed material which caused violent symptoms when injected into animals, no poisoning of this type is traced to food which is not decomposed and at least three-fourths of the outbreaks in England are due to bacilli of the Salmonella group. This group multiplies rapidly in warm weather and does not as a rule cause visible changes in the food but produces very irritant toxins. A study has been made of 200 outbreaks to determine the varieties of food responsible for the ingestion of the Salmonella bacteria. It was found that 30 per cent were due to canned foods, 7 per cent to milk, 8 per cent to milk products (mostly ice cream and cheese), 27 per cent to made-up meats, 4 per cent to manipulated foods

like stuffed meat, 16 per cent to fresh meat, 4 per cent to fruit or vegetables, 3 per cent unclassified. Seventy-two per cent were traced to foods which had been handled in some way by man.

One outbreak in 1923, in which hundreds of people were sick and one died, was traced to ice cream having been cooled in a filthy place and sold through the streets in hand barrows. Some *Salmonella bacilli* were isolated from this ice cream. It was found the *Salmonella* toxin could be boiled for an hour or longer without destroying its toxicity. Botulism is somewhat infrequent in England. An outbreak occurred in 1922 caused by eating sandwiches containing wild duck paste. *Salmonella bacilli* are not normal to the human intestine but are found in diseased animals; it has been shown that botulism can arise from drinking the milk of diseased cows. Dr. Savage believes that the legislature has not provided for sufficient control over preparation and manufacture of made-up foods and believes there is urgent need for registration and licensing of premises where such processes are carried out, with periodic inspection and the power to close if necessary.—*Lancet*, 2:900 (Oct. 22), 1927.

Studies on the Effect of Abundant Cereal Intake—Feeding experiments on young albino rats have shown that when suitable supplementary foods are employed, whole grain cereals and at least one milled wheat breakfast food product when supplying as much as 84 per cent of the calories of the diet result in excellent growth, reproduction, lactation and general satisfactory physiological condition. Diets containing as much as 93 per cent whole grain calories approximate those of current normal standards, indicating that the limits of whole grain cereals in the diet are extremely liberal provided the diet is otherwise properly balanced. While the application of the results in rat feeding experiments to

human nutrition should be made with reservation, the science of nutrition would not warrant the conclusion that the results as reported in this paper do not have a practical bearing on nutrition in man. It is the conclusion that this work demonstrates the feasibility of the inclusion of cereal in the dietary in much greater amounts than is now common in this part of the world.—George R. Cowgill, Margaret H. Jones, Robert A. Frisch and G. P. Jackson, *J. A. M. A.*, 89:1770 (Nov. 19), 1927.

Relative Nutritional Value of White and Brown Breads—Professor Friedberger of Berlin carried out experiments to determine the nutritive value of various kinds of bread, particularly white bread, compared with *schwarzbrot* (brown bread, rye bread). "*Klopferbrot*" (boxer bread) produced the greatest increase in weight of rats of the same weight and the same litter, and white bread the smallest increase. Comparing the inside of the loaf and the crust it was found that white bread crust caused loss in weight. It was found that *zwieback* was responsible for a constant loss in weight up to their relatively early death which was ascribed to the great heating and double baking. When the animals were fed *einback*, which is the loaf before subjecting to the second baking, slight increases in weight were found, confirming former experiments indicating the change in weight producing value of food due to heating and showing the great variation in the weight producing value of bread in common use. While, on the basis of analysis of the food stuffs, it would follow that white bread is the best utilized in human economy, there is some doubt as to whether this should be the criterion in judging quality in an article of diet, believing to the contrary that, from the standpoint of weight gains at least, bread from the whole grains are to be favored.—*J. A. M. A.* 89:1798 (Nov. 19), 1927.

Digestibility of Potatoes as Influenced by Methods of Preparation—

A study was undertaken in order to determine whether or not fried foods are more indigestible than foods prepared in other ways in view of the universal application of frying in the preparation of food. Potatoes of the Early Ohio variety were used and kettle-rendered pure lard employed for frying. The potatoes were cut in uniform pieces and cooked by three methods—French fried, pan fried and boiled. The digestibility of these potatoes by different methods was determined in vitro, and studies were also made in the case of 2 dogs, 4 men and 1 woman of the time required for the emptying of the stomach of potatoes prepared by these methods. It was found that the starch of the potatoes fried in cold fat is more easily digested by pancreatic juice than boiled potatoes or hot fried potatoes. In the case of the dogs, boiled potatoes were emptied from the stomach more rapidly than fried potatoes, there being no appreciable difference in this case between French fried and pan fried. In 4 of 5 human subjects, potatoes were emptied from the stomach at the same rate whether boiled or fried. A delay in emptying was found, however, if the potatoes, after cooking take up excess fat or fat is added as gravy or butter. It was also found that the gastric motility is more susceptible to

the inhibitory action of fats in some individuals than in others. The conclusion is reached that in an average normal individual, fried potatoes, unless steeped in fat, are no more likely to cause digestive disturbances than boiled potatoes. —Bessie Boggess and A. C. Ivy, *J. Home Econ.*, 19:496 (Sept.), 1927.

Serum Against Mushroom Poisoning—Fatal mushroom poisonings are due to the alkaloid phalline, muscarine being much less dangerous owing to its emetic action. Symptoms of phalline appear about 10 hours after ingestion of the poison when it attacks the blood and produces hemolysis. M. Dujarric de la Riviere, professor at the Pasteur Institute, has prepared a serum from the horse for treatment of mushroom poisoning. Hypodermic injections of this serum are highly prophylactic and of therapeutic value when applied to laboratory animals.

In one case of a family in which three had been poisoned simultaneously, the physician was able to secure but two ampules of the serum and administered these to the most seriously affected, while the third, who had not received the injection, died. The Congress of Hygiene passed a resolution recommending supplies of this serum be kept in hospitals and for the accommodation of physicians.—*J. A. M. A.* 89:1529 (Oct. 29), 1927.

CHILD HYGIENE

MERRILL E. CHAMPION, M.D.

Etiology of Respiratory Disease in the City and Country Schools of New York—Dr. Lincoln presents a study of school absences from respiratory infections. One hundred and thirty-two children, aged 3 to 12 years were studied. Stool examination, urinalysis and physical examination by the physician were made in each case. Chest roentgenograms were made in many instances.

Preventive measures were taken during the school years 1921 to 1924 inclusive and were very detailed. In spite of these measures the rate of absence due to respiratory diseases, colds, tonsillitis, grippe, influenza, etc., was not greatly reduced. This compares with the experience of other physicians. Age and season, as seen by the reports, were determining factors to some extent.

Following the apparent failure of this program an intensive study was made of the 1923-1924 period. One striking point came up: The children in two school-rooms that were constantly reported to the physician's office as "too cold," showed a marked decrease in the rate of morbidity from colds. There was no correlation between the state of nutrition and the amount of respiratory disease. Conclusions are quoted in full:

1. A statistical study of absence from school due to respiratory diseases is presented.

2. Environmental factors in the classroom and home of each child, were studied, as well as the results of the physical examinations and a careful survey of his diet.

3. The only direct correlations obtained were between absences due to respiratory disease and the presence of abnormal conditions in the upper respiratory tract and between absences due to respiratory disease and the amount of carbohydrate in the daily diet of the child.—Edith M. Lincoln, M.D., *Am. J. Dis. Child.*, Sept., 1927.

Amalgamation of Child Welfare and School Medical Work—Amalgamation of school and preschool service has advantages and disadvantages. Dr. Clark discusses both but presents the desirability of such coöperation as practically inevitable in view of future development along lines of unification of public medical work in local affairs.

To his way of thinking "The completion of the supervision of child life in public medicine is the most pressing demand of our time"—the preschool age being "a vital one in preventive medicine."

He feels that school medical service should be transferred to the public health committees. It would then be looked upon "as a primary health service and would in no sense be in danger of relegation to a place of secondary importance."

Dr. Cassie deals wholly with "points of immediate practical importance," and feels that amalgamation is not desirable from the administrative side as it would constantly interrupt instruction of mothers in child care. This work is done by "infant visitors" who are "specialists among nurses" and if their work were to be combined with school nursing interruptions caused by "epidemics of infectious diseases, periodic school examinations, etc.," would be frequent. (This argument, by the way, is certainly well illustrated in much of our local nursing work in our own states. Also, the nurse's preference would, very humanly influence her work.)

Points in favor on the clinical side are summarized as follows:

1. A greater variety of work.
2. School work can be done in the morning when child welfare clinics are not so well attended.

3. In county areas a saving of time and travelling expenses can be obtained by careful organization.

4. Continuity of records.

R. Veitch Clark and Ethel Cassie, D., *Pub. Health*—Sept., 1927.

Five-Year Infant Mortality Study Buffalo, N. Y.—Dr. Hollingshead's Report of the infant mortality in Buffalo covers the period 1922–1926.

In the preceding years, 1910 to 1921, the number of infant deaths under 1 year dropped from 165 to 94 per 1,000 live births, but in 1922 the rate went up again to 102 and this stimulated the interest of the city department of health which asked the Buffalo Foundation to make this study.

The data on birth and infant death records for the city for the 5 years have been studied by wards and special districts, by nationality of parents, by cause of death and age at death, by hospitals at which the births occurred, and by physicians in attendance.

The study by wards is a valuable method as by such means the city sections most needing attention are given more attention. In the eight wards the infant mortality rate ranged from 125 per 1,000 live births to 62. Resident and non-resident mothers were separately grouped—also mothers born in Italy, in Poland, in Buffalo, and in the United States outside of Buffalo.

With the Polish-born mothers the infant mortality was 122 per 1,000 live births. With the Italian-born mothers, it was 87, and with the American-born mothers 85.

An interesting point was the fact that 6 per cent of the deaths of babies of Buffalo-born mothers occurred under 2 months, while only 37 per cent of the babies of Polish-born mothers and only 41 per cent of the babies of Italian-born mothers occurred at this early age. The question arises how much of this might be due to lack of breast feeding on the part of the American-born mothers. The causes given were premature birth, in-

juries at birth, and "other conditions of very early infancy."

More babies died of respiratory diseases in the group of mothers born in Italy, while digestive diseases caused a higher proportion in the group of mothers born in Poland. Twelve per cent of deaths of infants of Buffalo-born mothers were reported caused by malformations as against 6 per cent among infants of the Polish-born mothers and 5 per cent among those of mothers born in Italy.

The negro mothers' babies showed an infant mortality of 120 per 1,000 live births.

Midwives attended 16 per cent of all births and lost 2 babies under 2 weeks of age for each 100 babies attended.

Thirty-three per cent of the babies were hospital born. Infant mortality rates in hospitals varied from 10.9 to 1.3. In all strictly maternity hospitals the infant mortality rates averaged below 4.5 per 100 deliveries.

Two groups of physicians were studied. The first group of 20 had an average infant mortality of 4.6 per 100 live births. The highest mortality was 8.6 babies under 2 weeks of age in each 100 births attended. The lowest figure was 1.5 per 100 live births. These physicians average 700 births each for the 5-year period.

The second group of 33 physicians had an average rate of 4.3 per 100 deliveries. This group averaged 290 births each for the 5-year period.—*Pub. Health Rep.*, Nov. 25, 1927.

The Toothbrush in Preventive and Curative Dentistry

One of the greatest achievements in the scope of preventive and curative dentistry—and the one most often neglected by the general practitioner—is the toothbrush.

Tooth brushing is an important factor in treatment, because it is the treatment that patients receive most frequently, approximately twice a day, while they visit the dentist once or twice a week

during active treatment and only once every month, two months, or sometimes six months to a year during passive treatment. It is of importance not only as a curative agent in removing disease but as a therapeutic agent in preventing disease.

Tooth brushing is necessary not only to cleanse the teeth, which I believe was formerly the primary function of the toothbrush, but also to stimulate the gum tissue and consequently the blood supply to the gingiva, the alveolar bone, the pericementum or peridental membrane and the tooth itself through the connection of the apical blood vessels with those of the gingival mucosa, the bone and the pericementum.

Quite often with proper brushing we see the tooth take on a luster. This is due to the removal of the mucous deposits, and mainly to the stimulation of the blood supply to that tooth indirectly. If the diet were such that the teeth and the peridental tissue received the proper stimulation during mastication, causing the blood vessels to be compressed and dilated, this method of tooth brushing would not be necessary. Just as the muscles in our bodies aid the circulation of the blood by their contraction and relaxation—the contraction compressing the vessels driving the blood out into the veins and the relaxation allowing new blood to flow in—so do we, with the toothbrush, produce a like condition.

We know how good we feel after a work-out at the gymnasium, though this would not be necessary if we led the ac-

tive lives of our ancestors. The gingival tissues of our ancestors did not need stimulation because it was produced by the diet, and since it is absent in our present mode of living, we must produce it artificially. The method has rightly been termed "physical culture for the gums."—Samuel Miller, D. D. S., *Dental Digest*, Dec., 1927.

COMMENT

With the increasing stress that is being laid upon tooth brushing as a means of keeping the gum tissue normal as well as a good health habit and an added factor in preventing tooth decay, school nurses, dental hygienists and other health workers might well improve on their present methods of teaching children to brush their teeth.

The old way of giving toothbrush drills with throat sticks, pencils or fingers on the outside of the face may be effective as a form of military drill but it has very little connection with what the child actually does when brushing his teeth at home. Learning to brush the teeth properly is a serious thing, especially at the age of 6 or 7. A few minutes of personal instruction with each child or to a group of three or four in a place properly equipped with a mirror, running water and a good tooth brush, followed by periodic inspection, with proper rewards to help this brushing to become a habit will accomplish more in a few minutes than toothbrush drills from kindergarten to high school.—Eleanor B. Gallinger, D.H.

PUBLIC HEALTH NURSING

MIRIAM AMES, R.N.

Canadian Red Cross Outpost—rural hospitals are no longer an experiment in Canada. A thrilling glimpse is given us by S. Leslie Bell, R.N., of the kind of experiences met with by the public health nurses who have elected to do pioneer trail-blazing in the sections of the provinces remote from cities.

The establishment of Outpost Hospitals is part of the constructive work undertaken in the peace-time program of the Red Cross. There are three types:

1. The center of field nursing. The nurse works in the homes and schools of the district, but no provision is made for inpatients.
2. The rural Outposts with accommodation for one- or two-bed patients, but with field nursing as the chief work of the nurse.
3. The Outpost in a village or small town which functions as a small hospital.

A request for the establishment of an Outpost Hospital comes from a community where medical, nursing and hospital facilities are lacking. The need of the community is determined first by means of a thorough survey to ascertain present conditions and to determine what might be expected in the future. The community is asked to furnish the building and as much of the equipment as it can. Other agencies occasionally assist in meeting some of the expense, and the Provincial Division assumes a share of financial responsibility for an initial period, which differs according to the need of a particular locality. After the initial period, the service is continued but under a different plan. The Red Cross continues to operate, but the community guarantees to refund a percentage of the operating deficit. The community undertakes ultimate maintenance of the Outpost service as soon as it is able. No Red Cross Outpost or rural hospital is oper-

ated in any district unless an active branch of the Red Cross exists, or is established, to coöperate with the Divisional Office in operating the Outpost.

During the 7 years of Outpost activity, 32,219 patients have received treatment at or through these Red Cross Outposts.

The governments of the provinces in which Outposts are established recognize them as hospitals according to law, and the ordinary per diem allowance for patients is made. Thirty-nine Red Cross Outpost Hospitals are already operating throughout Canada, and there are requests for many others which could be established to advantage, provided the expense for establishment and upkeep could be met.

When the patient cannot go to the Outpost, the nurse goes to the patient. Where the physician is too far away to be available, the judgment of the nurse is called upon to an extraordinary extent. Last year, 3,088 patients received over 30,000 days of attention of the Red Cross nurses. Seven hundred and forty-three babies were born, most of whose mothers would have gone unattended. Both preventive and curative work are done.

The contribution which Canada is making to the cause of public health is far-reaching; not only has it benefited the Canadians, but other Red Cross societies have recognized the value of this plan and are establishing similar services.

NOTE: The plan for the establishment of rural hospitals by the Commonwealth Fund in the United States is comparable—the nuclei of our future public health nursing centers in rural communities—S. Leslie Bell, R.N. *Am J Nursing*, Nov., 1927

Learning By Suffering—A large medical school has decided that the theoretical study of diets and of diseases is

not enough. Just because a meal contains the proper number of calories, properly distributed among the dietary essentials, does not mean that such a meal will be palatable to the patient. Therefore, after the student plans the meals which he considers necessary, the dietician selects one "usually the most unpalatable and poorly balanced." The prospective physician then has to weigh out the food and eat the meal.—*Learning by Suffering*, Editorial, *J. A. M. A.*, Oct. 29, 1927.

First Periodic Health Examination

—The City Club gave over four days of the week of November 14 to the work, and in that time examined 57 women. Of that number 56 had made the preliminary applications, sent in the required specimens for routine laboratory tests, and otherwise complied with the requirements. The 57th applicant made the journey from another state for the express purpose of having the examination. More than 50 women were turned away because the time allotted did not permit more examinations to be made.

It should be said in passing that one of the reasons that the carefully planned schedule worked so well was that not one of the women who had applied broke her appointment or was late. Truly a record of feminine achievement!

The examinations were conducted by young physicians under the direction of Dr. Roger I. Lee. A thorough physical examination was made, and for those who specified a preference a woman physician was assigned. Two volunteer nurses prepared patients, weighed, measured, took histories, and were ready for any additional service. Members of the committee, Dr. Mary R. Lakeman, Dr. Marion Coon and Dr. Susan Coffin, kept regular hours at the club each day, and were the connecting link between doctors and patients. One feature particularly appreciated by the doctors was that the telephone switchboard arranged a special

service by which they were constantly in touch with their own offices.

Four rooms and two bathrooms on one floor in the club house at 5 Walnut Street were assigned to the work. A special table was provided in one of the bathrooms for gynecological examinations.

The results proved conclusively that the health examination was worth while. Proper health habits such as well balanced diets and sufficient rest were all that were needed in most cases to assure good health. However, in 3 cases serious conditions previously unknown and demanding immediate attention were discovered.

Dr. Lee plans to send a follow-up letter to every woman who was examined, explaining her condition and making his recommendations. It is hoped that Health Week will presently become a fixed period on the yearly calendar.

An account of the First Periodic Health Examination is given by Elizabeth Ellam, Publicity Director of the Women's City Club of Boston. This new activity sets an example that might well be followed by women's organizations with lasting benefit to themselves and their communities.

Advance in Flood Area—The old saying "no loss without some small gain" can be well applied to the Mississippi flood district. The gains as far as public health is concerned are indeed many. The prompt action of the Red Cross at the time of the flood, cooperating with national, state and local health agencies, demonstrated to hundreds of thousands the value of preventive medicine. Instead of disease following in the wake of the flood, the health conditions are better than they have been for years.

While the results of this unplanned, unexpected demonstration are still fresh in the mind, permanent health units are being formed by the U. S. Public Health Service and the Rockefeller Foundation, in cooperation with the state departments of health. To insure competent personnel for these health units, the

Rockefeller Foundation has opened a training center in Indianola, Miss. By September 5, 12 physicians, 10 nurses, and 19 sanitary officers had completed their training. On that date, there were still in training 11 physicians, 13 nurses, and 18 sanitary officers. Also applications for this course had been made by 5 physicians, 11 nurses and 1 sanitary officer.—Public Health Advanced Twelve Years in Flood Area, by William DeKleine, M.D. *Red Cross Courier*, Nov. 1, 1927.

Studies Children's Food Habits—

Eating at the family table at too early an age, overweight during infancy, eating insufficient food, staying up too late at night and idiosyncrasies about eating were among the causes of malnutrition revealed by a study of 30 children reported by Dr. Louis W. Sauer in the *Journal of the American Medical Association*.

Bringing a child's weight up to normal results almost without exception in improvement in chronic ailments, Dr. Sauer said.

Good results in the treatment depend on removal of the underlying cause, cooperation on the part of the patient and the family, eating sufficient food of the proper kind and establishment of proper rest, exercise and play.—*Hygeia*, Nov., 1927.

When Measles Threatens—A physician is often faced with the need for convalescent serum which he is not able to obtain. Parents are many times unwilling to have their children give blood for others outside the family. In family epidemics, the school child is usually the one who contracts the disease and exposes his smaller brothers and sisters, to whom measles may be fatal. ("More

than 90 per cent of deaths from measles occur under the age of 5 years and 75 per cent under 2 years.")

It has been found in a series of 7 cases that blood taken from a school child sick with measles one or two days after the return to normal temperature and injected into the gluteal muscles of younger children five or six days after exposure resulted in 6 cases of modified measles. In one, measles did not occur.—Modified Measles, The Use of Convalescent Blood From A "Family Donor," by Roy P. Forbes, M.D., and Berryman Green, M. D. *J. A. M. A.*, Nov. 5, 1927.

Change in Personnel, Advisory Committee—At the 56th Annual Meeting of the A. P. H. A. in Cincinnati, October 17-21, the Public Health Nursing Section recommended to the Committee on Administrative Practice that a sub-committee on public health nursing be founded. This sub-committee will confer with the main committee in relation to its studies and findings and render such assistance as is necessary to the Committee on Administrative Practice.

It was voted that the committee to study and report on Advisory Committees for Official Public Health Nursing be continued with a change of personnel to study the urban rather than rural needs. This committee will consist of Clyde C. Slemmons, M.D., Henry F. Vaughan, D.P.H., Francis X. Mahoney, M.D., Mary Gardner, R.N., Cora Templeton, R.N., Amelia Grant, R.N., Mrs. George Hunter, Mrs. C.-E. A. Winslow, Mrs. Frederick S. Roth and James A. Tobey, Dr.P.H.

The section voted to discontinue the Committee on Annual Reports since the subject of Annual Reports is being considered in relation to the entire study of Records.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

Health Education in Many Lands—Why do we need health education? What is health education? How is health education being done? Answers to such questions as these, with illuminating examples of the best practice in different countries, are given in the "Health Education Number" of *World's Health* (League of Red Cross Societies, 2, Avenue Velasquez, Paris. 20 cents.). Oct., 1927. There are many illustrations and 2 pages of colored reproductions of European posters on avoidable industrial accidents. We would like to fill this department for several issues with quotations from the contents which include a "Foreword" by Sir George Newman; "Popular Health Education," by Dr. Rene Sand, an interesting review of methods and materials; "How to Awaken a Health Intelligence," by Louis Forest; "Educational Aspects of the Health Demonstration," by J. A. Kingsbury; "Press Publicity," by Dr. Gordon Bates; "Health Education in the Home," by Hester Viney; "A School Health Education Programme," by D. J. Kelley; and book and article reviews. Many health workers will wish to secure copies. Order direct, or send 20 cents to the editor of this department before January 20.

Home-Made Bulletin Board Posters in Racine—Posters better than the average factory bulletin posters are produced as blueprints (11 by 14 inches) by the Racine Board of Health, adopting a suggestion of the Wisconsin Anti-Tuberculosis Association, as "a method of securing small quantities of attractive

posters at low cost." Happily the health officer's wife, Florence Marvyne Bauer, is an artist who works for the department without charge. Says Dr. W. W. Bauer: "These posters are made on tracing paper in India ink. From this tracing we make 100 blueprints and two or three Van Dykes. The blueprints are distributed to 100 of our largest factories where they are placed on shop or employment office bulletin boards. For the Van Dykes we use a standing picture frame with a removable glass back instead of the usual board back, and by setting these in window sills where daylight is transmitted through them we have a most attractive reverse of the blueprint poster. The removable backs of the frames make the subjects easily interchangeable. The State Anti-Tuberculosis Association artist is furnishing us tuberculosis subjects and we are making our own posters on other health topics.

"Another application of this method is the use of Ozalid prints, a comparatively new process which produces a reddish brown positive print direct from the tracing. The Ozalid print is opaque to reflected light but translucent to transmitted light so that it may be used either as a transparency or a bulletin board poster. The cost of these prints exclusive of the drawings is 5 cents each for the 11 by 14 blueprints in quantities of 100. The Ozalid prints are 6 cents each, and the Van Dykes 12 cents. By using the Van Dykes as negatives we can get blue line or positive blueprints, and in this way can secure three varieties of posters and two varieties of transparencies from one original tracing. We are planning to add to our series a number of posters setting

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

orth various health ideas.. By means of this inexpensive process we can have a variety of posters which are strictly our own, much greater than would be possible to health departments with small appropriations where the printing or lithographing process is employed.

"While the supply lasts, we will be glad to send samples upon request to responsible health organizations or workers." (A set of these posters were shown at Cincinnati, October 17-21.)

"He Means Well But . . ."—
 "Some well meant efforts which are bizarre and offend good taste may do harm rather than good. An atrocious poem, song or play, taught to children in behalf of dental health, may not hurt the child, although it represents a poor type of education, but it may disgust the teacher and others. There is also some question in my mind as to whether we are not laying too great stress on speaking campaigns in our efforts at education. Evangelistic methods may have served a good purpose in the past, but the public is getting rather fed up on after-dinner speeches, campaigns and special days."
 —Planning and Organizing a State Dental Program, by W. R. Davis. *Pub. Health*, Lansing, Aug., 1927.

DATES AHEAD

The Annual Motion Picture Conference, January 26-28, New York, N. Y., will include review meetings in projection rooms of film companies. Address: Better Films National Council, 70 Fifth Ave., New York, N. Y.

National Negro Health Week, announced for April 1-8, 1928, is an undertaking which deserves encouragement and help from health agencies. The local committees for Negro Health Week may be very glad to have the benefit of the wider experience of health workers in organizing their campaigns, especially if the helpers stay in the background. Some

state health associations may serve as secretaries of state-wide celebrations. The program as outlined suggests far too many topics, but cooperating health agencies may lead local communities to select certain topics for concentrated effort. Various national agencies offer cooperation which is described in the manual to be issued by the U. S. Public Health Service, Washington, D. C., about the time this notice is published.

International Social Welfare Fortnight, Paris, July 2-13, 1928, offers international gatherings on housing and town planning, child welfare and social welfare, plus the International Exhibition of Housing and Social Progress (June 15-July 15), and the Royal Sanitary Congress and Exhibition (July 10-28), London. There is also the possibility of visiting the great museum on health at Dresden and the one in Munich. The two latter afford many ideas for making exhibits graphic and interesting. Requests for information about any of the above will be forwarded by Committee on Publicity Methods, 130 East 22d St., New York, N. Y.

February—1928

- 5-11. Boy Scout Anniversary Week—
 Address: Boy Scouts of America, 200 Fifth Ave., New York, N. Y.
11. Daniel Boone's Birthday
12. Lincoln's Birthday
 Race Relations Sunday—Address: Federal Council of Churches, 105 East 22d St., New York, N. Y.
- 12-18. National Drama Week—Address: Drama League of America, 59 East Van Buren St., Chicago, Ill.
14. St. Valentine's Day
17. Founders' Day: National Congress of Parents and Teachers, Address: 1201-16th St., N. W., Washington, D. C.

21. 21st Anniversary Celebration: National Child Labor Committee—Address: 215 Fourth Ave., New York, N. Y.
22. George Washington's Birthday.

1927. Twelve health hints, most of them for daily application. Simple, practical, avoiding the suggestions frequently offered which many readers will not accept as being practicable or important.

Nearly all of the above dates offer opportunities for coöperation, congratulation or utilization by health agencies of various types.

The National Academy of Visual Instruction will meet in Boston, Feb. 27-28, 1928. Address: J. V. Ankeney, secretary, State Dept. of Education, Charleston, W. Va.

TIMELY MATERIAL

"Avoid Colds," by W. W. Peter. *Cleanliness Journal*, 45 East 17th Street, New York, N. Y., Oct., 1927. *Free*. "Keep away from walking transmitters who broadcast disease germs."

"Dress According to the Weather." State Dept. of Health, Boston. Press release. Dec. 5, 1927.

"Carbon Monoxide Gas Kills Without Warning," with application to gas ranges and heaters in the home. *The Foreman*, Wausau, Wis. Nov., 1927. *Free*. "You cannot see it! You cannot smell it! You cannot taste it! You cannot feel it!"

Health as described, lauded or defined in ancient and modern literature—in "Health Quotations." *The Campaign*, Iowa Tuberculosis Assn., Frankel Bldg., Des Moines, Ia. June, 1927. 4 cents.

"Guide book for Better Homes Campaigns in Cities and Towns." 10 cents. "Guide book for Better Homes Campaigns in Rural Communities and Small Towns." 5 cents. Better Homes in America, 1653 Pennsylvania Ave., Washington, D. C.

The campaign handbooks mentioned here from time to time contain ideas for alert publicity workers, whether or not they participate in the respective efforts.

"A Daily Dozen." Press release. Oregon State Board of Health. April 19,

TITLES

"It Hurts!" *Hygeia*, Dec., 1927. "The why and wherefore of pain."

"Measles, the Killer." N. M. Bureau of Health.

"A Vanishing Spook—Diphtheria." *Canadian Red Cross Junior*, Toronto, Can. Nov., 1927.

WORDS

Before you again write or speak the word "tubercular" ask for "Tuberculous or Tubercular," a folder by P. P. Jacobs. National Tuberculosis Assn., 370 Seventh Ave., New York, N. Y. *Free*.

TRAINING

Health workers in Iowa and nearby states interested in publicity may wish to attend one of the one- or two-day publicity schools to be conducted at various points in the state by Extension Service, Iowa State College. Address at Ames for details.

SLOGANS

"Cancer, Be Quick"—*Commonhealth*, Boston.

"Time, Tide and Cancer Wait for No Man"—*Commonhealth*, Boston.

POSTERS

A three-section poster bulletin board is offered at \$3.00 by National Safety Council, 108 East Ohio St., Chicago. Space for one 17 by 23 inch, and two 9 by 12 inch posters. Intended primarily for safety and health posters in factories, but may have other uses. Illustrated description *free*.

Subscriptions to *The Poster*, the special authority on the subject, are offered among the prizes announced for a poster contest being conducted by the *North-*

Western Health Journal, St. Paul, organ of the Minnesota Public Health Association. A series of articles on poster-making will appear in the *Journal*, which lists (Nov., 1927) selected sources of information and help—but fails to give prices except in one instance! Anyone wishing copies must write twice.

HOUSE ORGANS

Much health material is distributed through the Red Cross Junior magazines published in many countries. Examples are given in a review of the junior publications in *Our Junior Magazines*, by E. G. Keller. *World's Health*, Paris, June, 1927.

The *Health-O-Gram* is a weekly 1-page mimeographed bulletin started in June by the Newark Department of Health. The items are short paragraphs, some in telegraphic style which makes it easier to be concise. Dr. Craster writes: "It will be issued each week and our circulation is to be built up among local laymen, school teachers and such mediums of publicity as newspapers, magazines, etc. At present, we are only mimeographing 500 each week and have received requests from several citizens and a couple of magazines. The newspapers are quoting it, and I believe it will be used largely in the schools to which we already send daily contagious disease reports, thus eliminating any additional postage for the schools. The heading is a multigraph plate, so the only cost is the paper and a few minutes time each week." Dr. Craster may wish to experiment with colored paper, no two successive issues being alike.

The Listening Post, Penn. Dept. of Health, is now *Pennsylvania's Health*.

Sanidad de Cuba, Department of Health, Cuba, illustrated common fly dangers in its December and February issues.

Cleanliness Journal, Cleanliness Insti-

tute, 45 East 17th St., New York, N. Y. *Free*. "The material may be reprinted, with or without credit."

Dental News, 58 East Washington St., Chicago, Ill. "Official bulletin of the House of Delegates of the American Dental Association."

SCHOOLS AND CHILDREN

A new series of the two-page Health Calendar starts with October, 1927. "Please color me and hang me up where folks can see me." *Free* copy of Wisconsin Anti-Tuberculosis Assn., 558 Jefferson St., Milwaukee, Wis.

The use of a questionnaire among mothers to check the effectiveness of a school safety program is described in "Measuring the Results," by Florence Nelson. *Child Welfare Magazine*, Sept., 1927.

"How the Schools Promote Health"—a nine point summary. *Journal of National Education Assn.*, Washington, D. C. Oct., 1927.

"Questions Prove Inadequacy of Health Instruction," by Laura Cairns. *Nation's Health*, June, 1927. How 46 high schools answered 47 questions, most of which could be given to other groups.

ERRORS AND OMISSIONS

The editor of this department very earnestly solicits corrections of errors of any nature.

Please tell of any omissions of desirable material, or the failure to give sufficient detail in any instance.

Reports of any difficulties in securing copies or in looking up references will be welcome.

Help to make this department both useful and usable, and aid to a better understanding of difficulties in getting all the information and help health workers wish to have.

LAW AND LEGISLATION

JAMES A. TOBEY, LL.B., DR.P.H.

The tumult and shouting begin—With the convening of the Seventieth Congress on December 5, the correlation of federal health activities is once more a national legislative issue. Mr. Parker was planning to reintroduce his bill in the same form in which it was before the last Congress. Submission to the procrastination and devastation of the Director of the Budget will not again be necessary, and further hearings may not be required. It is to be hoped that a favorable report can be secured in the near future from the Committee on Interstate and Foreign Commerce of the House and that the bill can go on the calendar and eventually be passed.

This measure is of importance and interest to sanitarians, but to most members of Congress it is only one of the

nearly 20,000 bills with which they are deluged. A number of national problems of great significance are before this session of Congress and will have to receive prior attention. Thus, flood control, tax reduction, farm relief, and more battleships must be broached, discussed, and fought about, while in the Senate much time will undoubtedly be spent on the question of admitting two of their members-elect, who were a little too lavish in their expenditures in the primaries.

Such progress as there may be on bills of interest to sanitarians will, as usual, be reported in this department. On the first day of the session, more than 5000 bills were introduced. It will be a month before it can be ascertained which of these are concerned with national health.

Scheme No. 12—During the last half century or so, at least eleven proposals of major significance have been advanced for the centralization or coordination of the scattered health activities of our national government. These efforts have been listed by Professor Robert D. Leigh in his admirable book, *Federal Health Administration in the United States*, (page 498), as follows:

1. The Cox plan of 1872 for a bureau of health in the Interior Department.

2. The Bowditch plan of 1875 for a Cabinet department of health.

3. The National Board of Health, 1879–1883.

4. The Committee of One Hundred plan for a Cabinet department, 1906–1912.

5. Representative Mann's plan for a Health bureau in the Department of Commerce and Labor, 1910.

6. The Taft Commission on Economy and Efficiency proposal for an independent health service, 1910–1912.

7. The Smoot bills for a consolidated health unit under an assistant secretary of the treasury, 1912–1915.

8. The Harding-Sawyer-Kenyon proposal of a health unit as one of four main divisions in a department of public welfare, 1919–1921.

9. The plan of the Joint Committee on Reorganization for public health as one of three main divisions in a new department of public welfare as part of a general reorganization scheme, 1923–1925.

10. The plan of W. F. Willoughby for a department of public health as part of general reorganization, 1921–1923.

11. The plan embodied in the Parker bill (the author calls it the "Tobey proposal").

To these eleven serious attempts to make more effective our federal health activities, Professor Leigh adds a pro-

osal of his own. He suggests a new department of education and health. It would comprise the Public Health Service, Children's Bureau, St. Elizabeth's Hospital, and Bureau of Education. There would be an advisory health council and various interdepartmental boards. The divisions of the proposed department are completely set forth and details to or liaison with other federal bureaus, such as Indian office, Bureau of Mines, Women's Bureau, Bureau of Dairy Industry, etc., are provided. It is suggested that this new department also supervise the health activities of the District of Columbia.

This interesting proposal may be an ideal, but on account of many practical difficulties, political and administrative, it will be a long time before it receives serious attention.

Congressional matters to interest physicians—Although the American Medical Association has twice gone on record in favor of the principles of the Parker bill for federal health correlation, this measure is not included in a description in the A.M.A. *Bulletin* for November, 1927, of nine matters of interest to physicians which are likely to come before Congress.

The nine subjects said to be of importance to the medical profession, whose policies regarding them are expressed, include: (1) a proposed measure to insure notice to all interested parties of every regulation proposed by the Commissioner of Prohibition under the narcotic or prohibition laws; (2) a measure for the control of cosmetics in interstate and foreign commerce; (3) deduction by physicians from their income tax returns of traveling expenses incurred in attending professional meetings; (4) an amendment to the national prohibition law, allowing physicians to prescribe as much alcohol as the patient needs (therapeutically and not socially); (5) legislation to secure retirement privileges for

disabled medical officers who served temporarily during the World War; (6) more hospitals for veterans for treatment whether incurred in line of duty or not; (7) a medical practice law for the District of Columbia; (8) further extension of the Maternity and Infancy Act; and (9) anti-vivisection legislation.

The American Medical Association is in favor of the first five measures and the seventh, if they are introduced; but it is opposed to the sixth, eighth, and ninth.

More Arguments Against the Sheppard-Towner Act—Some alleged administrative anomalies of the federal Maternity and Infancy act are pointed out by Dr. W. C. Woodward and J. W. Holloway, Jr., of the Bureau of Legal Medicine of the A.M.A. in the Association's *Bulletin* for November, 1927. They call attention to the fact that the term "infant" legally means any person under 21 years of age, but that, judging from the hearings on the bill before it was passed, the law was intended to embrace only infants under 1 year of age. Then they quote from the plans of 19 states, as approved under the law, which are concerned with older children. Too harsh criticism should not be directed against the federal officers who administer the law, the authors believe, but criticism should rather be directed against the uncertain terms of the act itself.

Reporting on suspicion upheld—The reporting of actual cases of disease to health officials has frequently been upheld by the courts. Requirements to this effect are proper, and physicians who make the reports in good faith are not liable for damages of any kind. Now comes the decision of a court which upholds the reporting of suspected cases of disease, even though an injury results. In this case, *McGuire v. Amyx*, 297 S.W. 968, decided by the Supreme Court of

Missouri, the facts seem to indicate that the physician made a mistake, but since he acted in good faith, as a reasonable and prudent man would do, there was no liability.

The facts were that a woman went to consult her physician about herself. She was accompanied by her 7-year-old daughter. While examining the mother, the physician noticed a rash on the child and concluded that it indicated or was suspicious of smallpox. He notified the health department and the child was taken in an ambulance to a quarantine hospital, where the chief diagnostician pronounced her as afflicted with smallpox. The child was not sick and during the 9 days she was confined to the hospital played in the yard and with the nurses. Six days after her discharge from the hospital she became sick and developed an unmistakable case of smallpox. The parent as next friend brought suit against the physician, the diagnostician, and the hospital superintendent for \$30,000 damages. He failed to recover in the lower court and this decision was affirmed on appeal, 8 years after the episode occurred. The court stated:

The public health is of the greatest concern to all. By law its keeping rests with the attending physicians, householders, and health officers. Public policy favors the discovery and confinement of persons afflicted with contagious diseases, and we think it not only the privilege, but the duty, of any citizen acting in good faith and on reasonable grounds to report all suspected cases, that examination may be made by experts and the public health thereby protected. We hold this may be done without being subjected to liability for damages.

Although stating no new proposition of law, this is an important decision on the liability of health officials and of physicians in connection with their public health responsibilities. Not only does it hold that a physician is not liable for a mistake in judgment in reporting a suspected case of communicable disease, but also that a health officer who exam-

ines a patient and quarantines him because he has reasonable grounds to believe that the safety of public health requires such action, cannot be held liable merely because it turned out that he was wrong. Even though the patient contracted smallpox as a result of the mistake, there is no liability so long as the health officer did not act wantonly or recklessly.

Whether or not there was actionable negligence in any such set of facts is, of course, a question for the jury to decide. In this case they found for the defendants and the court upheld the decision on points of law advanced against it on appeal.

Child Labor Day—The problem of child labor is not yet solved, according to the National Child Labor Committee, which has sent out an announcement of a Child Labor Day the last week-end of January. The committee says:

Child Labor involves more than the mere question of the age at which a child should be allowed to go to work. It includes the prohibition of all work for children under 14, and of dangerous work for children under 16; it includes the establishment of an 8-hour day and the prohibition of night work for children under 16; and evidence that the child is strong enough for work.

In 14 states the law now carries an exemption which makes it legal for children under 14 to work in factories or canneries, at least out of school hours; in 11 states children are permitted to work 9 to 11 hours a day; in 17 a physician's certificate is not required of a child starting work; in 28 children of 14 may work around explosives; in 22 they may run elevators; in 17 they may oil and clean machinery in motion.

Chicago wins—The State of Wisconsin brought suit in the United States Supreme Court against the State of Illinois and the Sanitary District of Chicago in order to stop the diversion of the waters of Lake Michigan through the

American Journal of Public Health

and THE NATION'S HEALTH VOL. X NO. 2

Volume XVIII

February, 1928

Number 2

What Can We Do About Measles?*

GEORGE C. RÜHLAND, M. D., FELLOW A. P. H. A.

Director, Syracuse Health Demonstration

and

A. CLEMENT SILVERMAN, M. D.

*Director, Bureau of Communicable Diseases Syracuse Health Department,
Syracuse, N. Y.*

THE ultimate conquest of measles depends no doubt upon the discovery of the specific causal agent and the development of an immunization procedure, similar to that now employed against diphtheria and scarlet fever. Perhaps the dawn of the tomorrow that will bring this achievement is not far distant; certainly the laboratory research worker is busily endeavoring to determine the etiology of this disease.

At present, however, there still seems considerable doubt as to the identity of the specific organism. Whether the green streptococcus of the Tunncliffe ' type will prove to be the real cause, whether it is the green diplococcus of Ferry,² or whether these are merely variant symbionts and the true causal agent is a filtrable virus other than those mentioned, as Park³ suggests and Degkwitz⁴ insists, the future must determine.

In the meantime the health officer faces the fact that measles occurs with distressing regularity of from 2- to 3-year intervals and spreads rapidly in spite of the usual control measures.

A recent survey by the U. S. Public Health Service, based on inquiries made of several thousand university students in different parts of the United States,⁵ shows that approximately 90 per cent of males and 95 per cent of females 20 years of age and over had suffered attacks of measles. This indicates fairly well the still widespread prevalence as

* Read before the Health Officers Section of the American Public Health Association, at the Fifty-sixth Annual Meeting at Cincinnati, O., October 17, 1927.

well as the high incidence of measles. The factors that are responsible and contribute to the usual rapid spread of measles are, of course, well known.

There is the exceptionally high degree of infectiousness of the disease itself, the difficulty of recognizing and so controlling the disease during the prëruptive stage, when infectivity is highest, and the unfortunate popular belief that measles is after all only a negligible disease of childhood with a corresponding indifference and lack of coöperation on part of the public. A sense of hopelessness in the face of these overwhelming adverse odds no doubt is responsible for the general lesser interest that characterizes official activity when dealing with measles.

This attitude on the part of the health officer, Dr. Godfrey¹ maintains, is an additional reason why better progress in the control of measles has not been made so far. Agreeing that with present facilities any attempt to prevent *all* measles is foredoomed to failure, he suggests that action should concentrate on a program to protect especially children under 3 years of age, since after all fully 70 per cent of all measles deaths fall within that age period.

Although Brownlee, in England,² urged a similar program for the protection of child life in the early age group, it appears that nowhere was a consistent effort made to try out such a plan.

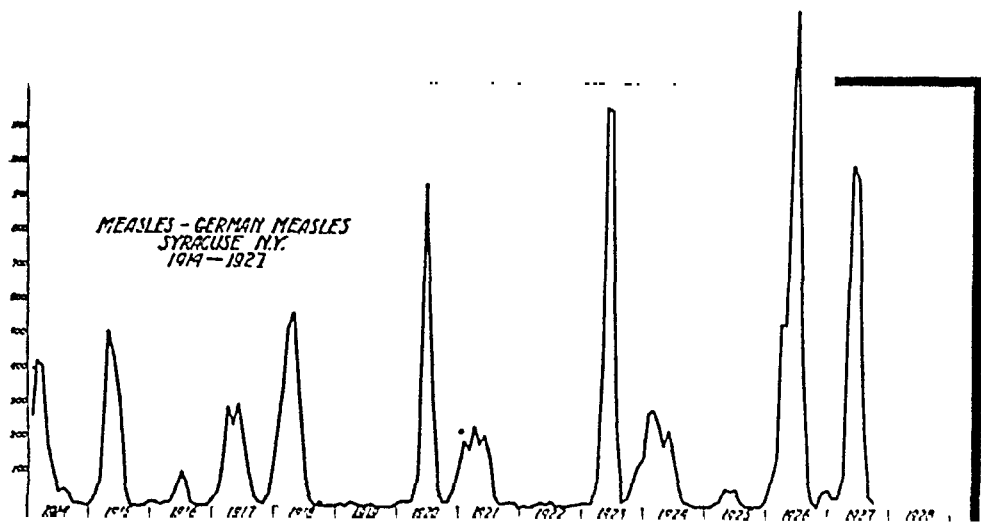
An opportunity for such a practical tryout of the plan presented itself to us in Syracuse in the late winter of 1926. A study of the history of measles in Syracuse shows that measles appears there in 3-year intervals. The outbreaks, beginning usually late in February or early in March, run through 2 years, with a summer remission each year, showing a crest of the epidemic wave in May, which then falls rapidly in June. With a record of a measles epidemic in 1923-24, it was therefore a simple matter to forecast the next epidemic for 1926-27. See Chart I.³

PLANS AND PROCEDURES

Knowing that an epidemic of measles was impending, the next step was to plan for action that would secure as much protection as possible for children under 3 years of age. Three things seemed especially important to this end:

1. To arouse the public, especially those families having children in the dangerous age group
2. To secure the coöperation of the medical profession
3. To develop the departmental machinery, i.e., especially the nursing staff

For the first of these steps the press was taken into our confidence. Through the daily papers announcement was made, even in the fall of the year 1925, that according to past experience Syracuse would have



Profile showing periodicity of measles at Syracuse

an epidemic of measles beginning in the late winter or early spring of 1926. It was pointed out that, contrary to common belief, measles, through complications, is a dangerous disease, especially to children under 3 years of age, and to all delicate children. Since it was difficult to recognize measles during the early stages, all children exhibiting any symptoms of a cold should be put to bed, kept separate from other children, and a physician called to pass upon the case. Warnings were also issued against the seriousness of complications which might follow if children were allowed to leave bed too early during the convalescent period.

All cases were to be reported promptly to the Health Department. The medical profession was likewise informed through the department's *Weekly Bulletin* of the impending epidemic, and the use of human convalescent immune serum was urged and offered for children of the dangerous age group. Special pains were taken to impress upon the nurses of the department the high degree of contagiousness of measles, the usual modes of transmission, early symptoms, and—above all—the great necessity of protecting children under 3 years of age and all delicate children.

The importance of discovering all contacts at the earliest possible moment and of segregating them, if possible, and the giving of human convalescent immune serum to every young and delicate contact was also stressed. Detailed information was given on the instruction of families having measles cases. Each nurse was furnished with typewritten copies of these instructions. Families under quarantine were furnished copies of the educational measles folder supplied by the State Department of Health.

The epidemic developed, as predicted, in February, 1926. The public was kept informed as to the progress of the epidemic, with constantly repeated urging to call a physician early and to give special care to the child under 3 years of age and to all delicate children.

The department operated with an average of 21 field nurses during the time of the epidemic. The nurses employed by the Department of Public Instruction (20 in number) gave valuable assistance, bringing the total number of nurses available to a ratio of about 1 to each 4700 of population.

At the beginning of the epidemic, Dr. Godfrey, Director of the Division of Communicable Diseases of the New York State Department of Health, detailed one of his nurses to assist in organizing the home visit work of the nurses. The State Health Department also furnished some human immune serum, though most of the serum used was obtained locally from convalescent patients.

Schools were not closed during the epidemic, nor were infant welfare clinics discontinued. Due to our following a generalized nursing plan, it was possible to devote the greater part of the home visit service of the nurses to the search for measles cases and the instruction of families. It was necessary to hospitalize only 24 cases because of home conditions.

STATISTICAL DATA

In dealing with the statistical facts of the 1926-27 measles epidemic in Syracuse, it should be understood that the efforts of the department centered not in the prevention of all measles but in an attempt to protect child life, especially under 3 years of age, and to lower, if possible, the mortality for that age period.

In Table I is presented the total number of cases and deaths, together with the indicated fatality per 100 cases for the epidemics of 1923-24 and 1926-27 respectively, as well as the number of cases and deaths with their fatality at different age periods.

There were reported for the epidemic of 1923-24 of German measles and measles a total of 4,722 cases with 59 deaths, or a fatality of 1.38 per 100 cases as against 5,317 cases of true measles with 18 deaths, a fatality of 0.34 per 100 cases for the epidemic of 1926-27. This seems a fairly favorable showing—the mortality rate for the 1926-27 epidemic representing a 68 per cent reduction from that of the preceding epidemic. This rate seems especially favorable when it is considered that the total number of cases for the epidemic of 1923-24 includes German measles, whereas the total for the 1926-27 epidemic counts true measles only.

TABLE I

MEASLES CASES REPORTED, DEATHS AND CASE FATALITY PER 100 CASES REPORTED, BY AGE GROUPS
SYRACUSE, 1926-1927

	1923-1924 ¹		1926-1927		Fatality per 100 Cases	
	Cases	Deaths	Cases	Deaths	1923-1924 ¹	1926-1927
ALL AGES	4722	59	5223	18	1.38	0.34
Under 1 year	119	9	164	5	7.56	3.04
1 year	314	21	324	7	6.68	2.16
2 years	423	14	424	2	3.30	0.47
3 years	481	7	534	2	1.45	0.37
4 years	447	1	537	1	0.22	0.18
5 to 9 years	2492	5	2600	1	0.20	0.03
10 years and over	446	2	640	..	0.44	...

1. Figures for 1923-1924 include German measles, but it is probably unlikely that very many cases were reported; for 1924 only 111 cases of German measles were recorded.

It is interesting and significant also to compare the fatality rate of 0.34 of the 1926-27 epidemic with the modal case fatality rate for cities with a population of 100,000 or more, which, according to Sydenstricker, is about 0.6 (based on 15 years of frequencies). This will give Syracuse a rate of 43 per cent under the average for cities in this population group.

The difference in the mortality rate for the two Syracuse epidemics under consideration shows up even more markedly when these rates are considered by age groups. For children under 1 year of age the 1923-24 epidemic shows 119 cases with 9 deaths, giving a fatality rate of 7.6, as against 164 cases with 5 deaths and a fatality rate of 3.0 for the 1926-27 epidemic.

ANALYSIS OF STATISTICS

For *all* cases under 3 years the fatality in the 1923-24 epidemic is 5.1, as compared with a rate of 1.6 for the last epidemic. It appears then that the mortality from measles in Syracuse during the 1926-27 epidemic was 69 per cent lower for the age period under 3 years, compared with the immediately preceding epidemic. The question now arises—May we accept that this improvement in mortality stands in any relation to what was done? This in turn calls for an inquiry into:

1. The nature of the epidemic, i.e., was it milder than the preceding one?
2. Was there any material difference in the proportion of susceptibles or in the age distribution in this group?
3. Are there any tangible factors in what was done that could have brought about improved results?

Nature of Epidemic—So far as the first of these questions is concerned, it is of course impossible to give absolute proof as to the virulence of the epidemic in question. There are no bacteriological standards by means of which the virulence of the contagium of measles, whatever it may be, can be tested. Nor is there clinical evidence unless we accept the impressions of the clinician as to the virulence of the epi-

demic of 1926-27 as compared with the one preceding. We must therefore fall back upon a comparison of mortality figures at Syracuse with those of other nearby cities as the only measurable factor on the basis of which the probable virulence of the 1926-27 measles epidemic may be judged.

Taking for this purpose the statistics of measles in the cities of Rochester and Yonkers, both of which reported epidemics of measles in 1926, we find the following:

	<i>Number of cases</i>	<i>Deaths</i>	<i>Fatality per 100 Cases</i>
Rochester	2437	17	0.70
Yonkers	3782	44	1.16
Syracuse	2714	4	0.16

It is understood, of course, that this represents a comparison for only one year of the epidemic.

The many factors that ordinarily stand as objections in comparing the general mortality of one city with that of another are also fully appreciated. However, notwithstanding all this, it yet seems not unreasonable that the specific mortality for measles in the communities in question should serve as an indicator to the virulence of measles at that time and season and for this section of the country.

TABLE II
MEASLES CASES REPORTED AND PER CENT DISTRIBUTION BY AGES
SYRACUSE, NEW YORK

	<i>Cases Reported</i>		<i>Per Cent Distribution</i>	
	<i>1923-1924</i>	<i>1926-1927</i>	<i>1923-1924</i>	<i>1926-1927</i>
	4722	5223	100.0	100.0
Under 1 Year	119	164	2.5	3.2
1 Year	314	324	6.7	6.2
2 Years	423	424	9.0	8.1
3	481	534	10.2	10.2
4	447	537	9.5	10.3
5	681	635	14.4	12.2
6	705	761	14.9	14.6
7	547	549	11.6	10.5
8	373	414	7.9	7.9
9	186	241	3.9	4.6
10-14 Years	287	405	6.1	7.8
15-24	101	154	2.1	2.9
25-34	40	51)		
35-44	14	23)	1.2	1.6
45-54	3	4)		
55-59	1	2)		
60-64 . . . . .		..
65-69		1		

Figures for 1923-1924 include German measles. See note to Table I.

For all of the three cities in question 1926 was an epidemic year. For all the cities climatic conditions are about the same. For all of the cities the seasonal period of the epidemic was the same. The cities

TABLE III

NUMBER OF MEASLES CONTACTS GIVEN IMMUNE SERUM AND RESULTS, BY AGE GROUPS
SYRACUSE, 1926-1927

	<i>Number Given Serum</i>	<i>Developed Modified Measles</i>	<i>No Measles</i>
ALL AGES	155	74	81
Under 1	38	8	30
1	40	22	18
2	34	24	10
3	22 ¹	13	9 ¹
4	7 ²	3	4 ²
5	7	2	5
6	2	0	2
7	3 ²	1	2 ²
8	1	1	0
9	0	0	0
10	0	0	0
11	1	0	1

1. Of these 1 has a doubtful history

2. Of these 1 exposure is probable but not definite

are in comparatively close proximity to and in communication with one another. It seems difficult under these circumstances to assume that there should have been any marked variation in the virulence of measles for the respective cities which would not have affected all of them. It may be accepted therefore that the factor of virulence in the 1926 epidemic did not materially vary in favor of Syracuse.

Proportion of Susceptibles—We now examine the next point that could have influenced the mortality; namely, the proportion of susceptibles and the difference in the age distribution for this group. The history of measles for Syracuse shows a rather uniform recurrence of epidemics after about 19 months quiescence. Syracuse is a community of rather steady and average growth. There are no marked fluctuations in the loss or additions to her population. Participation of the number of susceptibles in different age groups in the epidemics has been about the same, so that the factor of an abnormal accumulation of susceptibles cannot be considered as a determining point.

In Table II is shown the number of cases according to age group for the epidemic of 1923-24 and that of 1926-27 and the percentage distribution of cases by age for the two epidemics. It will be seen that this is quite uniform for the two epidemics. Of particular interest is the per cent distribution of cases for the age group under 3 years. In the 1923-24 epidemic this group shows 856 cases, or 18 per cent of all cases reported. The 1926-27 epidemic records 930, or 17 per cent, for this same age group.

Factors bringing results—This brings us to a consideration of the third and most material point; namely, What specific results, if any, were noted in relation to specific methods employed? Is there any

TABLE IV

MEASLES CONTACTS GIVEN CONVALESCENT SERUM SPECIFIED TIME AFTER EXPOSURE
AND RESULTS OBTAINED
SYRACUSE 1926-1927

<i>Time after first exposure when serum was given</i>	<i>Children Given Convalescent Serum</i>		
	<i>Total</i>	<i>No subsequent Measles</i>	<i>Modified Measles</i>
TOTAL	155	81	74
1 to 4 days	54	34	20
1 day	4	4	.
2 days	14	11	3
3 days	20	13	7
4 days	16 ¹	6 ¹	10
5 to 8 days	94	44	50
5 days	42 ²	19 ²	23
6 days	31	16	15
7 days	13	5	8
8 days	8	4	4
Days unknown	7	3	4

1. One of these had a doubtful history

2. Two of these exposures were probable but not definite.

evidence that the public responded in any way to the educational campaign? It is obviously difficult to answer this question unqualifiedly, especially in such a way that would demonstrate that an improvement in popular interest in the epidemic was noted, since there are no comparable data.

It is nevertheless interesting, and undoubtedly significant, that in an analysis of 726 primary cases of measles during the recent epidemic a physician was called in 653 cases, or nearly 90 per cent, on or before the 4th day of illness. When we consider that a physician is not usually called for what appears to be an uncomplicated cold, such as the symptoms of measles in the preëruptive stage, then we are justified in concluding that this record shows a most remarkable response to the health department's educational effort.

The practice to call a physician before the 5th day after the onset of illness was undoubtedly an advantage in treating children in the under 3 years age group with human immune serum.

Tables III and IV give our experience with the use of human immune serum. Out of a total of 155 patients that received serum, 81 did not develop measles, and 74 developed modified measles. Two cases outside this group that received serum on the 9th and 10th day following exposure developed measles with complications, indicating that serum employed so late after exposure is of course useless. There was no measles fatality in the entire group. Of the entire series of 155 cases treated by serum, 112, or 72.2 per cent, were children under 3 years of age. In this group 54, or 48.2 per cent, developed modified measles; and 58, or 51.7 per cent, did not develop it.

SUMMARY

It is of course clear that, with the experience of but a single epidemic, conclusions must be limited and drawn with care. Insufficient data for the preceding epidemic makes comparison for every point impossible. Nevertheless, the following statements seem warranted:

1. The plan of Brownlee and Godfrey, to concentrate on the age group under 3 years for a reduction in the mortality of measles, seems entirely practical, and has in the management of the 1926-27 epidemic at Syracuse apparently yielded substantial reduction in the mortality of children under 3 years of age.
2. The plan can be most effectively carried out under a generalized nursing system.
3. Useful public interest and coöperation in such a plan can be stimulated and sustained to a remarkable degree by proper publicity.
4. The plan does not require new methods, but merely calls for an intensified application of known procedures.

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The Eleventh Annual Roll Call

SIX hundred and forty-three thousand dollars for 20 disasters abroad, \$8,216,893 to relieve 690,000 people as a result of 77 domestic disasters! These are the figures given in the report of the last fiscal year of the American Red Cross.

At the time of the Mississippi Flood, many of those who watched their property being destroyed, or who suffered even greater losses which could not be redeemed by money, learned for the first time the meaning of Red Cross Disaster Relief.

The national and international program of the Red Cross is ever increasing. There are more demands for service and the Red Cross must act in the name of the people of the United States. Is it not fitting, therefore, that the Red Cross should look to the people for the support which larger membership gives? These are the reasons for membership drives:

1. That the files of enrollment in the nursing service may be kept up to date and ready for instant service
2. That disaster equipment may be constantly in readiness
3. That the public health nursing program may be kept going
4. That the teaching of home hygiene and other educational activities may be continued

"Forty-five thousand enrolled Red Cross nurses should be able to influence many times that number of persons to join and thus to participate in the work of the greatest humanitarian agency in the world." In its effort to secure 5,000,000 members the Red Cross offers a challenge to the national pride, conscience and spirit of the American people.

The Preparation and Presentation of Papers*

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THE FIRST requisite for a paper is having something to say which is of value. Many editors demand that the matter presented shall be original or given from a new viewpoint—a good rule, though many valuable papers consist of a review of what has been presented by others with conclusions which bring order out of chaos and give to the average reader a clear idea of existing knowledge.

All editors are pestered by authors who present potboilers, which are usually papers on something new which is proposed, or old material worked over in slightly different form. In medicine this is particularly the case, but less so in the class of papers presented at meetings like that of the American Public Health Association or to such journals as its official organ.

The subject having been selected, the presentation should be made as clearly and briefly as possible. Long historical reviews are generally out of place, though a certain amount of history will often tend to clarify what the author has to present. Quite recently it has been the practice to give long bibliographies, but most journals have taken a stand against this, since in many cases it has been perfectly evident that the authors had never read the articles, but had copied lists given by other writers, who in turn had copied from their predecessors. It was a common thing to find errors passed down through a long series of writers.

The title should be descriptive, but not an abstract of the matter presented. Ambiguous and nondescriptive titles may deprive an author of the satisfaction of being quoted, since the reviewer of literature is misled. Too many papers are built on the plan of the Negro preacher for his sermons: "First, I takes a text, then I tells 'em what I is going to tell 'em; then I tells 'em what I wants to tell 'em; then I tells 'em what I has done told 'em." A certain amount of repetition may be useful, but in general it should be avoided.

* Read before the Joint Session of the Health Officers and Public Health Education Sections of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 18, 1927.

Subheads and conclusions are useful, but the latter should be strictly in accordance with the evidence presented. Note this extract from a recent English review of an article by an American: "The reviewer would enter a mild protest at the growing habit of recording conclusions which bear little obvious relation to the data set out in the body of a paper; particularly when, as in this case, the actual heading of the final section is 'Summary and Conclusions.' "

Quotations should be correct and brief. The average reader of scientific journals is probably as conversant with literature as the average writer. A reference with perhaps a short quotation is generally all that is needed. No article should be essentially a reprint of material by other writers.

Good style is hard to acquire and some writers never master it. Everyone knows that certain articles are read with pleasure while others, which may contain better material, are exhausting. Good associations in early life are almost essential for good writing and good speech, but much can be accomplished by study, reading and practice. A good writer is never lazy about consulting the dictionary. Style manuals, such as those put out by the Government Printing Office and publishing houses, and desk books, should be in the hands of every writer. The advice to "write and rewrite, rewrite again and then revise" is good. Sir Clifford Allbutt was a master of English, and no one would have suspected that he felt obliged to give a great deal of care to his articles; yet he tells us that he made at least four drafts of a manuscript. After making a rough draft from notes, a revision resulted in the cutting out of unnecessary words, phrases, sentences and paragraphs, by which he reduced the length from 20 to 25 per cent. He then recast sentences and paragraphs which seemed ambiguous, and gave particular attention to the choice of words fitted to convey the exact meaning intended. The manuscript was laid aside and some weeks later the final revision made. In America, the late Sir William Osler stood easily first among scientific men in his command of English, both in speaking and writing; yet it is known that he often made a first draft in long hand from notes, and as many as three others on the typewriter, the last of which was submitted to the printer. With such examples, the average man should certainly not expect to turn out a finished article in one sitting.

English is a rich language, if a difficult one. The correct word can always be found. Coining new words and giving new meanings to old words should be avoided.

A few examples of poor diction will suffice: The use of "case" instead of patient; Schick used as a verb, as "I Schicked him"; "I operated Mr. Smith." The verb "operate" means "to work." Does the sur-

geon unwittingly tell us that he "worked" Mr. Smith when he operated on him? From a noted clinic we have "The lines of divergence are converging"—a contortion equalled only by the advice given by a clergyman to his congregation: "Stop, turn round, and look yourselves square in the face." Boston contributes the following: "The principle of 'hormone' activity was studied subsequently by Bayliss and Starling alone, and both workers . . ."; "For a pittance by no means slight"; "He developed glands of the throat." . . . "Study in Vienna, Berlin, Strassburg and other trans-Atlantic foci."

Examples could be multiplied indefinitely, as everyone who has a rudimentary knowledge of English and who reads literature with a modicum of care knows.

PRESENTATION OF PAPERS

Not everyone has the gift of language, and many can never become forceful speakers; but all can follow certain elementary principles and give a clear presentation of ideas if their ideas are clear to themselves. At every meeting of this Association, as well as others, the audience is punished by speakers who have no consideration for their hearers and no appreciation of the lapse of time. Enthusiasm is a good trait, but carried to excess is very trying. Many of us can recall a paper which consumed an hour and twenty minutes; another, by a distinguished guest, almost as long, whose manuscript resembled Joseph's coat of many colors; lantern slides and charts poorly made and largely illegible, though essential to the presentation. Speakers will do well to remember the reply of the bishop to the curate who asked if forty-five minutes was too long for a sermon. The bishop answered that he would not care to lay down a hard and fast rule, but his experience led him to believe that the majority of souls were saved during the first fifteen minutes. Great discoveries and matters of exceptional importance sometimes deserve a longer time for presentation, but it is always well to stop while the audience is eager for one to continue.

The most effective speakers are often those who prepare their material, familiarize themselves thoroughly with it and speak from notes, in order to follow the chosen sequence, and to avoid digressions and the use of more than the time allotted. A common mistake is to interrupt the reading of a paper by making side remarks and giving illustrations. Some can do this gracefully, but the great majority annoy their audience, break the force of what they have written and lose the thread of their argument.

If one has originality and histrionic talent, the stereotyped methods may sometimes be abandoned with advantage. We recall the pleasure

given last year by a speaker who acted a dual rôle in an alleged argument over ventilation. What is more to the point, he put it across more effectively than could have been done by an hour of the usual dry-as-dust discussion.

If time is limited, as it should be and generally is, precious minutes must not be wasted in bemoaning the fact or telling how much more information could be given "if time allowed." Apologies for lack of ability or unpreparedness are generally out of place, often insincere and always tiresome. "Mock modesty is the worst form of pomposity."

THE EDITOR

The editor deserves some consideration, though writers should realize that the publication of their articles will be greatly facilitated by furnishing properly prepared manuscripts. We can hardly expect every contributor to know all the rules adopted for various publications, in order to obtain uniformity of type, capitalization, paragraphing, etc. These may be left to the editor, but he should have a clear manuscript, correctly spelled, typewritten, double spaced, and on one side of the paper only. One of the worst sins of writers is the misspelling of proper names, though all poor spelling is inexcusable. Especial care is necessary in giving correct references, which should be indicated by numbers in the body of the paper.

There is great lack of uniformity in abbreviations for references. We recommend the list of publications with the proper abbreviations given in *The Art and Practice of Medical Writing*. Titles of books and articles should not be abbreviated.

In America the standard size of manuscript paper averages 8½ by 11 inches. This size is adapted to ordinary typewriters, to linotype machines and to filing cases. There is little excuse for using odd sizes. There should be wide margins with plenty of room left at the top and bottom of the pages. Compliance with these rules facilitates publication and lessens the cost to the journal and often to the writer, since fewer corrections need be made.

THE REMEDY

With all compassion for the difficulties of program committees, we believe that they are often responsible for the poor papers presented. It has been suggested that each section should look over the list of those who have had places on the program during the past few years, including chairmen; pick out two or three whose papers were notably poor in substance or were badly presented, or who have persistently violated the rules; and refuse to let them read papers at the next meeting. The

papers could still be offered to the journal and published or not according to the judgment of the editors.

Certainly such action would put prospective authors and speakers on their mettle, and might induce them to follow the last piece of advice which this paper will give—to study one or more of the following books:

Allbutt, T. Clifford. *Notes on the Composition of Scientific Papers*. 3rd ed., 1923, 192 pp.

Mellish, Maud H. *The Writing of Medical Papers*. 2nd ed. rev. 1925. 150 pp.

Simmons, G. W. & Fishbein, Morris. *The Art and Practice of Medical Writing*. 1925, 163 pp.

Woolley, E. C. *New Handbook of Composition*. Revised by Franklin S. Scott. 1926, 341 pp.

Fowler, H. W. *A Dictionary of Modern English Usage*. 1926, 742 pp.

Joint Report of Voluntary Agencies and Medical Profession

AN agreement on methods of coöperation has been reached between organized voluntary health agencies and the medical profession in New York State. Their joint report was accepted by unanimous consent of the House of Delegates of the State Medical Society and the Board of Managers of the State Charities Aid Association.

The joint report is regarded as significant in that it promises more "harmonious and effective development of public health in New York State." It is hoped that through this movement similar agreements may be reached in other states.

A resumé of the things agreed to by each county medical society and the voluntary health agencies is as follows:

1. To appoint members of the county medical society to serve as members ex-officio on the board of directors or the executive board of the voluntary health agencies.
2. To study and consider any program activities of any voluntary health agency for information and suggestion.
3. To appoint a special committee on public relations to confer with committees of the voluntary health agencies on matters of mutual interest.
4. To report to the State Medical Society any matter upon which no decision can be reached with the voluntary health agency, in the hope that some satisfactory settlement can be reached.

The voluntary health agencies also agree to conduct at least one open meeting annually.

The State Medical Society was represented on the Joint Committee by Dr. G. W. Cottis of Jamestown, Chairman; Dr. Wilbur G. Fish, Ithaca; Dr. W. Warren Britt, Tonawanda; Dr. Thomas P. Farmer, Syracuse; Dr. Terry N. Townsend, New York City. Dr. George M. Fisher, then President, and Dr. Joseph S. Lawrence, Executive Officer, were members ex-officio.

The representatives of the State Charities Aid Association were Dr. Livingston Farrand of Ithaca, Chairman; Homer Folks, Yonkers; John A. Kingsbury, Yonkers; Dr. H. G. Weiskotten, Syracuse, and Dr. Linsly R. Williams, New York. George F. Canfield, President, and George J. Nelbach, Executive Secretary of the State Committee on Tuberculosis and Public Health, were members ex-officio.



A Red Cross emergency hospital in one of the refugee camps. Similar facilities were provided in all camps with a doctor and nurse on duty.

Recent Health Observations in the Mississippi Flood Area*

WILLIAM DE KLEINE, M. D., FELLOW A. P. H. A.

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THE Mississippi flood in the spring of 1927 was the largest and most devastating disaster of record in the United States. The Florida tornado in 1926 was the next largest, crippling seriously more than 24,000 families. The Mississippi flood made more than 600,000 individuals temporarily destitute. The homes of more than 750,000 people were flooded, and many completely destroyed or badly damaged.

While smaller floods in the Mississippi Basin occur nearly every spring, the 1927 flood surpassed all others. Ninety-two counties and parishes in 6 states (Kentucky, Missouri, Arkansas, Tennessee, Missis-

*Read before the Health Officers Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 18, 1927.

NOTE. Dr. DeKleine was loaned to the American Red Cross and served as Acting Medical Director in August and September, during the illness of Dr. W. R. Redden. He spent most of this time in the flood district, which gave him an excellent opportunity to observe health conditions.

ssippi, and Louisiana) were either wholly or partially inundated for from 3 to 8 weeks, and in some instances for a longer period. The levees and river embankments of the Mississippi and its tributaries were broken in more than 200 places, submerging more than 20,000 square miles. The number of deaths from accidental drowning was, however, comparatively low—estimated at about 250.

The Red Cross was quick to recognize that it was facing not only an immense relief problem, but also a staggering public health problem such as had never been experienced in the United States in peace time. More than 100 refugee camps and relief stations were opened. The Red Cross fed, clothed, sheltered, and provided medical and nursing care for several weeks for more than 600,000 people, and rehabilitated their homes and properties after the flood had receded. More than 50,000 will be fed and clothed continually until the spring of 1928.

Wherever local hospitals were unable to cope with the situation, temporary hospital facilities were provided for communicable diseases, for the usual run of illness, maternity service and care of the new-born. A fund of more than \$17,000,000 was contributed to meet all these needs.

The concentration of so many people in refugee camps necessitated the closest supervision and regulation of camp life in order to avoid outbreaks of smallpox, typhoid fever, and other communicable diseases. The very crude condition of some of these camps made this problem all



In perhaps the most far reaching disease prevention program this country has ever seen in peace times, the Red Cross inoculated against typhoid fever nearly 410,000 persons and vaccinated against smallpox 163,000 in the 7 states affected by the Mississippi Valley flood. The doctor in this picture is vaccinating against smallpox in a Louisiana refugee camp.

the more difficult. The inundation of so large a territory with highly polluted water presented the possibility of contaminating many of the public and private water supplies, and, indirectly, many food supplies. It was therefore urgent that drastic steps be taken immediately to prevent typhoid and other intestinal infections, and epidemics of the ordinary communicable diseases.

CONFERENCE TO ORGANIZE FLOOD AREA

It was recognized early that the state and local health authorities were not prepared to cope adequately with this staggering problem because of the lack of funds. Immediate steps were therefore taken, with their approval, to organize the entire flood area for public health control. A conference was called in Memphis, on April 28, at the instigation of W. R. Redden, M. D. Medical Director of the Red Cross. To this conference were invited the state health officers, representatives of the U. S. Public Health Service, the Army and Navy, state medical societies, the American Medical Association, and others to discuss this situation and to put in motion the necessary machinery for adequate public health control. The U. S. Public Health Service immediately assigned Senior Surgeon John McMullen to the Red Cross Headquarters as liaison officers to coöperate in bringing such assistance to the local health authorities as seemed most desirable.

The public health work was, however, directed and conducted entirely by the state and local health departments. The Red Cross Medical Service acted as a clearing house to furnish supplies and personnel when requested. The nursing service in the field and in the refugee camps was directed by Elizabeth Fox, R. N., and Malinde Havey, R. N., Directors of the Red Cross Public Health Nursing Service. The staff nurses who served in the field and in the camps carried a large share of the disagreeable burdens and inconveniences that always accompany strenuous duties of this character. Local physicians, health officials, army medical officers, and volunteers from other communities and states carried the burden of the medical and public health services. Twenty-two states responded to an appeal for experienced personnel by sending physicians, nurses, sanitary officers, and other public health workers. Three hundred and twenty-nine nurses volunteered. One man came armed with a shot gun and offered his services for sanitary duty.

The U. S. Public Health Service furnished experienced personnel who were attached to the offices of the state health departments to help direct their work. This agency, in coöperation with the Rockefeller Foundation, also helped finance a program of organizing permanent

county health units, as will be described later. The Red Cross, however, is deserving of the credit of instigating and correlating the medical, nursing, and public health activities.

The correlation and direction of all these numerous agencies and activities, in which all these organizations participated, represent, we believe, an outstanding achievement and triumph in emergency public health administration. There was practically no overlapping nor duplication of effort, and there existed a minimum amount of friction and misunderstanding. It was a splendid example of effective team-work.

More than half a million individuals were immunized against typhoid fever, and about 200,000 against smallpox. More than 200,000 gallons of oil were used for mosquito control. Large quantities of quinine sulphate, estimated at 2 tons, were distributed and used for the prevention and treatment of malaria. With the exception of typhoid vaccines, the supplies were furnished almost entirely by the Red Cross.

The Red Cross also financed an extensive screening program. Under the direction of J. A. Le Prince, of the U. S. Public Health Service, more than 22,700 screen doors were constructed and installed, and more than 25,000 windows were screened. It was intended that all homes of malaria carriers should be carefully screened. This was done wherever possible, although the work was not entirely confined to that. Many houses were screened in localities where they could serve as valuable object lessons. This screening program had perhaps even greater value as an educational measure than as a means for the immediate control of malaria.

The organization of medical and nursing service and hospital facilities; the immunization program; the prompt isolation and quarantine of patients; the adoption of adequate sanitary and public health measures in the refugee camps; the supervision of food supplies in the camps; the screening program and other public health measures were no doubt responsible in a large measure for the excellent health conditions that were maintained. According to the records of the state health departments, the incidence of typhoid fever, diarrheal diseases in infants, smallpox, malaria, and certain other communicable diseases was materially lower in the flood area during the period following the flood than it has been during similar periods in the last 5 years. The figures as given by the state health commissioner of Louisiana are a fair example of what they are in other states. From January 1 to August 26, 1927, 142 deaths from typhoid were reported, as compared with an average of 463 for the same period for the last 5 years. One hundred and ninety-eight cases of smallpox were reported in 1927, as compared with an average of 713.4 for the same period in the last 5 years.



This little fellow had more exciting experiences in a week than many persons have in a life time. Rescued from the second story of his home, and carried in a small boat over the great "Father of Waters" to a Red Cross camp, he is in this picture receiving first aid treatment for his injured arm at the emergency hospital in the Vicksburg, Miss., refugee center.

This, we believe, is a triumph for public health and preventive medicine. It indicates that the incidence of communicable diseases and other illness and subsequent death rates can be controlled and materially reduced in the emergencies of peace time as well as in time of war. Secretary Hoover has designated it as a "triumph for public health and scientific medicine."

Pellagra has been a consistent problem of the South for many years. There has been a gradual increase in the incidence of this disease for the last four or five years. Dr. Joseph Goldberger, of the U. S. Public Health Service, made a survey of the flood area during July. In his report to the Surgeon General, he estimated that there were from 45,000 to 50,000 cases of pellagra in this district at the time of the survey, which is considerably more than usual. He attributes this increase largely to economic conditions. The history of the disease indicates very clearly that wherever economic conditions become stringent, the incidence of pellagra increases. Pellagra is confined largely to the cotton belt. With the exception of 1927, the cotton crop has not been very profitable for the past four or five years. This may account for impoverished rations and a subsequent increase of the disease. Whether the flood influenced it materially is not clear. It probably did to some ex-

tent; but the increase is not confined entirely to the flood area. There is a similar increase in other sections of the South, although perhaps not quite so great.

Pellagra results from the absence of certain food essentials in the diet. Dr. Goldberger has shown this conclusively both by animal experimentation and by careful regulation and observation of the dietary of patients in certain state institutions. He designates this food factor as the pellagra preventing, or P. P., factor, and indicates that it is, more or less, always associated with vitamin B. Foods containing vitamin B generally also contain the P. P. factor. Such foods as milk, lean meats, eggs, and certain vegetables have both factors. Yeast in concentrated form is well supplied with the P. P. factor, and is therefore also a valuable aid or remedy for the control of this disease. It should, however, be understood that yeast cannot serve as a substitute for food, but only as a temporary relief measure for treating and controlling the disease.

Upon the advice of Dr. Goldberger, and with the approval and cooperation of the state health officers, the Red Cross undertook to distribute a pure culture of brewer's yeast in powdered form for the purpose stated. This work was started about August 15, and is still in progress. The yeast was shipped to the local health agencies, and was made available to physicians and all public health workers. This is probably the first time a concentrated form of yeast has been extensively used in the United States as a public health measure. It has previously been used by research students and by a few physicians in private practice. At the present writing, more than 5 tons have been distributed in the flood area. We hope to be able to collect sufficient data later through the state health departments that will indicate its value as a public health measure in the control of pellagra. This report will be published at a later date.*

Anthrax in mules and cattle was a problem in certain sections. In a few localities, the disease became a serious problem. The writer was informed by one plantation owner that he had lost 75 mules, and he estimated there had been 1,500 deaths in mules and cattle from this disease in his county. The Red Cross furnished anthrax vaccine to state veterinarians, with instructions to use it freely wherever indicated. This problem, however, was not an extensive one.

The Rockefeller Foundation and the U. S. Public Health Service were quick to recognize an opportunity to develop permanent health units in the counties of the flood area. Through a carefully coördinated plan of procedure between these agencies and the state health de-

* Those who are interested in a study of pellagra and the use of foods and yeast for its control are referred to Dr. Goldberger's reprints published by the U. S. Public Health Service.

partments, this work was undertaken in the flood counties of the 6 states mentioned, after the flood had receded. It will be financed for a limited period jointly by these organizations, with the Rockefeller Foundation and the U. S. Public Health Service assuming the major share of the burden. Wherever the local communities are willing to meet their share of the health budget, the units will be established. They have been successful in organizing full-time health units in all of the flood counties in Kentucky, Missouri, Tennessee, Mississippi, and in the majority of counties in Arkansas and Louisiana.

In order to facilitate this work and to insure the employment of competent help, the Foundation also established a training center in Indianola, Sunflower Co., Miss. This training center also functions as the health department for Sunflower County. The director of the center acts in the capacity of health officer for the county unit. The training consists of a short period of instruction and observation in field duties, thus preparing the students for a more practical approach to their work. On October 1, 23 physicians, 23 nurses, and 37 sanitary officers had completed their training and were returned to the communities or states which sent them. This number has no doubt increased considerably since that time.

The Red Cross and all the other health agencies mentioned have rendered a very valuable service for the health of the entire flood area. Contrary to a general impression prevailing throughout the country, the health conditions of this district have been unusually good during the past summer. It will stand as a lasting monument to public health administration and health service. The damage wrought by the disaster has been offset to a large extent by the saving of life and the prevention of illness. The physicians, the health agencies, and the public have had a practical object lesson in health administration and supervision which should leave a lasting impression and should serve as a great stimulus for the progress of public health throughout the nation.



On the levee at Arkansas City, Ark., this Red Cross nurse vaccinated hundreds of inhabitants of the tent colony there against smallpox and immunized them against typhoid fever. These preventive measures are said to be chiefly responsible for the fact that there was no serious epidemic during the entire disaster.

DISCUSSION

Oscar Dowling, M. D., New Orleans, La.—Louisiana was harder hit by the flood than any other state involved. We had the water from the extreme northern part of the state and the extreme southern part of the state, extending more than 80 miles from east to west at the widest point. More than 700,000 people of our state were affected by this flood in one way or another. About 300,000 were driven from their homes. The statement of Dr. De Kleine was correct, I think, with reference to disease in Louisiana, with the exception that our records show we have not had any increase in pellagra as compared with the last 5 years. Whether we are going to have more remains to be seen. We are greatly indebted to the Red Cross, the Public Health Service, the International Health Board and state and city departments of health at various points in the United States, for valuable assistance in combating disease and in protecting the health and lives of our people.

We were fortunate in having ex-Governor Parker in charge of the work as the personal representative of Mr. Hoover and he started with the motto, "Not one life shall be lost." Three people were on the Texas-Pacific bridge when it was washed away; 2 of them were saved and 1 was drowned. Afterwards, when the refugees were beginning to return to their homes, a boat was capsized one day by people becoming excited and running to one side. This was not charged to the flood because we did not feel it should be charged that way. Therefore, our records show the remarkable results of only 1 life lost that could be charged directly to the flood.

I am happy to tell you that with the help we received from the outside and the work of our own people—because they all coöperated generously and unanimously with us—we came out of the disaster with better health than we had before which of course was most gratifying indeed. This was due we believe to the large numbers of people who were vaccinated against smallpox and immunized against typhoid, together with the service rendered in the camps, the food supplied, etc.

The flood waters first reached us the latter part of April and were with us until August. However, the state is now practically clear of the flood. The loss in financial and physical suffering no one can realize who did not see and go through it.

A. T. McCormack, M. D., Louisville, Ky.—It seems to me that this great session should not close without correlating these messages which have come to us and which are of the utmost importance to every single one of us and to the people we represent.

The emergency of a great disaster found us as unprepared from a scientific standpoint to solve its problems as we were when the World War came and the draft army was first assembled. We know that many of our boys were uselessly and needlessly destroyed because we had not prepared in advance for the solution of the problems that were then presented to the world. In the same way the Red Cross had to mobilize under its powerful influence, and with the very remarkable guidance of Secretary Hoover, the health agencies of the country, and a plan had to be worked out in the face of the disaster instead of having it all prepared in advance.

We had in a sort-of way, before the World War, prepared through the militia a second line of defence. The present problem will be met and solved if we take the combination of the papers presented, make practical their lesson in regard to permanent organization, profit by Dr. Bishop's message showing the remarkable manner in which records can be made to talk for themselves and be made standardized for all rural health departments, with the final summing up of the remarkable ac-

complishments of all of the agencies concerned when they were finally mobilized and gathered together in the flood area under the general supervision and stimulation of the Red Cross in this recent disaster. But for the future are we not going to take the lesson and learn from this emergency the necessity for having in every county in these United States a health organization, ready and prepared, around which can be mobilized those with like training and experience in other similar units over the country, so that in case of any particular disaster at any time, we can mobilize the whole health agencies of the country and focus them on the particular problem which demands solution? It can be done at the saving of millions of dollars. It can be done, as has been demonstrated here, in saving dozens, and frequently thousands of lives in each particular emergency. It seems to me that the important contribution of this whole major flood disaster was the New Orleans Conference (under the leadership of Dr. Redden of the Red Cross, Dr. Ferrell of the Rockefeller Foundation, the distinguished Surgeon General of the U. S. Public Health Service, and all the agencies involved where it was seen that this problem)—where the whole foundation of life in this vast area had been destroyed, where the possibility of healthy life had been interrupted—that these agencies were to gather together and over a period of 18 months conduct a restoration program that would enable people to live healthy lives in that fertile section again.

Are we merely going to restore the *status quo* in this vast area or are we going to demonstrate in these particular counties, through the remarkable work following this emergency, the necessity for such a foundation in every county in the United States and in the world? Whether this be done, as in the South, through the purely local control and local self-government in which we believe, or whether, as in the stronger and more centralized eastern states, through the district system that gets the power from above and proceeds downward, is not a matter of importance; but that in every district, every county, every government in the United States there shall be a permanent organization which shall be ready to carry on every day, not only during an emergency, is most important.

Because of the remarkable demonstration in the flood area in Kentucky, with a population of about 146,000 involved we were able, through the activity of our nurses and our health officers and through the mobilization of senior medical students of the University of Louisville, to inoculate against typhoid fever 75 per cent of the inhabitants in that area. And we have had less than 10 per cent of the typhoid fever which we had in any year in the past 10 years. Now this demonstration during the flood time when all the water was polluted, is the sort of thing that ought to sell the whole public health movement to the people of the other sections which have not yet had a flood. Do they want to wait until they have a disaster before they prepare? Would they want to wait until they have a fire to get a fire department?—or wait until they have a murder, a revolution and robberies and all the other violations of the law before they organize a police department? It seems to me it is just as important at this time that we make the people of the United States understand that a health department, properly organized and properly financed, with trained personnel, is just as essential to the future happiness and welfare of this country of ours as are our courts, our legislative bodies and any other portions of our civil government. That to my mind is the great lesson, the great end-result to be drawn from these three very remarkable papers that we have had the privilege of listening to here this morning.

Relief Measures During and Following the Mississippi Valley Flood*

J. H. O'NEILL

Sanitary Engineer, State Board of Health, New Orleans, La.

THE RECENT flood was, as all such floods are, a combination of synchronized events. A heavily flooded Ohio was met lower down by flood flows in the Arkansas and the White. These were due to rains in the corner of Oklahoma, Missouri, and Arkansas just at a time to bring the rivers draining that territory in concurrent flood with the Mississippi at their mouths.

A flood stage was reached in the Ohio River in March, and from that time on, with heavy rains in the various tributary valleys, the situation became more serious, and it soon became apparent that the valley was faced with the greatest high water fight in its history. The first break occurred at Walnut Bend, 278 miles below Cairo, on April 15; this was followed the next day by a break at Dorena, near New Madrid. Breaks occurred at 5 more localities in April, including a break on the west bank, about 40 miles below New Orleans, caused by a steamship running into the levee. The most serious of these was on April 21, at Stopps Landing on the east bank, about 20 miles north of Greenville, Miss., a city of 12,000 population.

Breaks occurred at 7 places in May, including the break on the east bank, about 15 miles below New Orleans, which was made purposely with a view to protect New Orleans by reducing flood heights at that city. These various breaks resulted in the flooding or partial flooding of 120 counties in 7 states and in driving 700,000 people from their homes. Nearly 600,000 of these were taken care of in 149 refugee camps. Others had issued to them rations and supplies. Three million, eight hundred thousand acres of agricultural lands were flooded.

This very brief history of the flood itself is offered as an introduction to a discussion of the main theme of the paper. It may give some idea of the duration of the fight. It cannot give more than a mere hint of its magnitude; of the length and strength of the battle line; of the constant and nerve straining vigilance to detect promptly such danger

*Read before the Public Health Engineering Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 19, 1927.

points as sand boils and bank caving; the almost superhuman efforts to strengthen defenses by raising low levees, by repairing the effects of wave wash and meeting in other ways the grim, relentless, and at times, irresistible attack of the Mississippi; nor of the really wonderful coördination of the work of the various agencies engaged in rescue; of the work of the National Guard troops, American Legion, and Texas cowboys in evacuating people and live stock from threatened areas; of the rescue fleet with its thousands of units varying from skiff and pirogue to surf boats, coast guard cutters and old paddle wheel river steamers; of the thrilling dashes through the roaring waters of a crevasse as a preliminary to a voyage over fields of cane, cotton, or corn, to collect a human cargo from house tops and trees; of the aviators who made aerial surveys to collect information for the guidance of the General Staff, located refugees for the rescue fleet, or carried physicians, nurses, drugs and vaccines to groups isolated by the turbid waters.

Stories of these are in themselves epics which will be told and retold for a long time to come. They will tell of heroic self sacrifice, of dogged courage in the face of overwhelming odds, of brilliant daring, of grim tragedy, of pathos and even of flashes of humor, but can only here be mentioned as a suggestion of a background for the problems of health and sanitation.

On April 22, an advisory committee of members of the Cabinet was appointed by President Coolidge, as President of the American Red Cross, in order to coördinate fully the resources and facilities of the government with the relief operations of the Red Cross. This committee included Secretary of the Treasury Mellon, Secretary of Commerce Hoover, Secretary of War Davis, and Secretary of the Navy Wilbur. This group met with representatives of the Coast Guard, the U. S. Public Health Service and the American Red Cross. A special committee of the Red Cross for the Mississippi Valley Flood Disaster, was established with Secretary Hoover as chairman. The purpose of this committee was, as expressed by Mr. Hoover, "to coördinate the activities of the War, Navy, Treasury and Commerce Departments into support of the Red Cross, which it was determined must continue the primary responsibility for the organization and administration of the relief measures to be taken."

Government agencies had been coöperating as in the past, but this marks the first time that government efforts were placed under the direction of the Red Cross. The efficiency and effectiveness of the relief work under this plan proved its value.

Headquarters for the conduct of all relief operations were promptly

established at Memphis. On April 28 a conference was held at Memphis to consider a program for health and medical service during the flood and for the coördination of the various agencies interested. There were present state health officers and sanitary engineers of states in the flood area; and representatives of the Medical Department of the U. S. Army, U. S. Public Health Service, American Medical Association, 7 state medical societies, and the American Red Cross Medical and Nursing Services.

The conference developed, and by a series of resolutions agreed upon the following program:

Need in any community for nurses, doctors, sanitary engineers, bacteriologists, epidemiologists, and other individuals should be made known to the state health officer, cleared through him and, when he might be unable to meet the request, he would clear for action with the Medical Director of the Red Cross.

Area Directors of the Red Cross faced with an emergency situation might clear direct with the Medical Director of the Red Cross who would then notify the state department of health of the action taken.

All personnel should be released through the same channels through which they came.

The system for obtaining needed supplies should be the same as that for personnel.

The general program of immunization should be restricted to typhoid and smallpox.

Where a case of diphtheria developed, immunization should be restricted to "contacts."

The determination of individuals to be inoculated should rest in the hands of the officer in charge and be limited as far as possible to actual contacts.

The same procedure should be followed with regard to the isolation and, when possible, the immunization in regard to all contagious diseases.

Each state health department should handle its own problem in matter of rabies.

The water in refugee camps should be chlorinated and water in private supplies recommended to be chlorinated, or boiled for thirty minutes where chlorination was impossible.

Where the milk supply did not comply with the minimum requirements of the Public Health Service, the milk was to be boiled. It was recommended that dried milk be used, where an adequate supply of fresh milk was lacking.

The extent and frequency of inspection should be determined by the state health officer in the state concerned.

The set-up of a refugee camp should be: physicians in command and necessary assistants and nurses; sanitary engineer, and supply officer; facilities for isolation; and dispensary and emergency hospital when there were no existing facilities.

Provision should be made for the proper disposition of sewage.

Garbage should be disposed of daily by scavenger service.

Adequate bathing and laundry facilities should be provided in the refugee camps.

All places where food was prepared were to be screened and under the supervision of the medical officer.

Food handlers had to meet requirements of the state health department.

The problem of mosquito control—involving malaria—is a problem which should be handled by the sanitary engineer, with whatever assistance he might need.

Chloride of lime and lime should be the general disinfectants used.

It was considered that hookworm and tuberculosis did not constitute an emergency problem at the time.

In effect this program put the responsibility for the protection of the health of the refugees and the sanitation of the camps and flooded areas where it belonged, on the state board of health, and offered to the state boards of health the resources of the American Red Cross, and through the Red Cross the resources of the U. S. Public Health Service and the trained personnel of other states, who volunteered to help in the emergency.

Fortunately most of the camps could be located where water from satisfactory city supplies could be made available. In some instances water was brought to camps in tank cars from neighboring cities. In others, chlorination of supplies by the use of chloride of lime was carried out under the direction of representatives of the health department.

Few of the camps had sewerage systems but multiple seat flyproof pit latrines provided a satisfactory substitute. Constant policing, however, was necessary to maintain cleanly and flyproof conditions. Many of the camps were electrically lighted and provided with showers baths and places for washing clothes. Kitchens and mess halls were screened.

Vaccination for smallpox and typhoid fever prevention was general. In very few instances was any opposition to this measure shown. Most of the people seemed to realize and appreciate the value of this method of protection. Isolation camps were provided and field hospitals were erected for minor surgical cases.

The small, and usually temporary encampments on the levee or on mounds offered the greatest difficulty. In some instances physicians, engineers, or sanitary inspectors were carried to these areas by airplane. They carried in a knapsack, emergency equipment and supplies, including medicines, dressings, vaccines, and chloride of lime for the treatment of water supplies. In Louisiana a laboratory boat used in shellfish control was assigned to flood duty and made a serviceable mobile unit.

At the camps opportunity was taken to do educational work on various lines. Talks were given on sanitation, mosquito control, personal hygiene, etc., illustrated, where possible, by lantern slides and moving pictures. Classes were held in child hygiene and welfare work.

Except for a few outbreaks of measles and mumps, the health records at the camps have been excellent. The health conditions in the area, as far as morbidity is concerned, were on the whole better than in normal periods.

Part of the problem included the maintenance and protection of water supplies and sewerage systems of communities threatened by the flood or affected only to a point which did not require evacuation of the town. Levees were built around water plants, or doors and windows were barricaded. Emergency power lines were run in. Extra pumps were installed to take care of leakage. This equipment comprised centrifugal pumps, with electric motor, or belt driven from tractor or truck; contractor's sump pumps with gasoline motor; or whatever might be available. Through the generosity of the manufacturers, chlorinators were loaned to state boards of health and many supplies were protected in this manner. In a few instances, where only a part of the town was flooded, or where the water was not deep enough to cause the people to leave, sewer pump motors were jacked up above flood level, shafts extended, and operations continued until the flood was over.

Following the receding of the flood waters, an organization of nearly 100 physicians, nurses, engineers, and inspectors was developed to sanitize the area. This organization included many volunteers from boards of health of states outside the Mississippi Valley.

Efforts were made to complete vaccinations of all who might have missed this treatment at the camps. Cases of diseases were investigated and measures taken to prevent spread of infection. An intensive campaign to promote the building of sanitary privies was undertaken, with really good results. Training was given local men employed temporarily as sanitary inspectors. Engineering advice was given local officials in the rehabilitation of water supply and sewerage systems. Private supplies were cleaned up and chlorinated.

Lime, chloride of lime, soap, spray cans, and crude oil were distributed and local crews were organized to clean up debris, bury or burn dead animals, and to open drainage channels, drain pools and spread oil to control mosquitoes. Medical supplies, including much quinine, were distributed liberally and where necessary; funds were furnished local chapters to provide for medical treatment for those unable to pay physicians. Hundreds of homes of malaria carriers were screened; five thousand pounds of yeast were distributed as part of the measures to prevent pellagra.

On June 5 a conference was held at New Orleans, at which there were present state health officers from the flood affected states; the Surgeon General, U. S. Public Health Service; Medical Director, American Red Cross; the Directors for the United States of the Health Division, Rockefeller Foundation; together with other representatives from these organizations.

The object of the conference was to receive reports of the state health officers in the flooded areas and to consider plans for the coöperation of the Rockefeller Foundation and the U. S. Public Health Service with the official health agencies in the flooded areas and the Red Cross in developing a permanent health program to meet the needs of the communities after the temporary program of health and sanitation of the Red Cross had been fully carried out.

The vast extent of the area involved, the large economic losses and other factors, such as the possibility of lowered resistance to disease due to poverty and hardship, and the development of pellagra made it apparent that a really effective sanitary rehabilitation and public health program was a long time job. The value of the full-time county *organization, or health unit, as it is generally called, had been strikingly* demonstrated during and after the flood and hence, plans were made to establish a health unit for a period of 18 months in 87 counties and parishes seriously affected by the flood.

The plans provide for a unit with the following personnel: health officer, public health nurse, sanitary inspector and clerk, with provision for travelling and incidental expenses. The budget is made up of funds from the county or parish, the state board of health, the U. S. Public Health Service, and the Rockefeller Foundation, the county's share nominally being set at 25 per cent but actually being determined by the community's ability to provide funds. Where investigation showed that the county was really unable to furnish 25 per cent of the budget, part or even all of this was contributed by the coöperating agencies.

The Rockefeller Foundation established a training school at Indianola, Miss., to train personnel to carry on the work of these units. On October 1, 45 units were in operation, 19 with full complement of personnel and 26 with from 1 to 3 people on the unit staff. In 17 more counties, plans had developed to a point where it was expected that the units would be in operation within a few weeks. This program not only seems the best and most practicable method of dealing with the post-flood problems, but since it is expected that many if not all of these units will be maintained after the 18-months period has expired, it will mark a real advance in the public health movement in the Mississippi Valley.

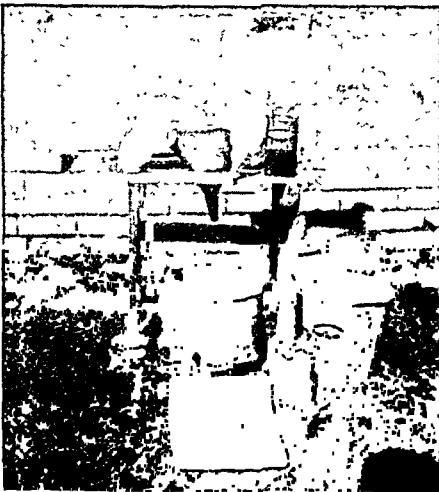
As this paper is presented to a gathering of engineers, the major part has been given to the sanitary features, but these were only a part of the task. Homes had to be repaired and rebuilt; deposits of silt removed from the towns; roads repaired; seed, tools, household equipment and clothes supplied; poultry and live stock replaced; and food

for man and beast furnished until the reclaimed lands brought forth new crops.

On September 3 the Red Cross was still feeding 62,486 persons, and 86,561 acres were still flooded. Owing to the second flood and other causes, probably 2,000,000 acres of crop land will make no substantial money returns this year. The Red Cross is still functioning in the area, which gives assurance that even though it may take some time to replace the huge losses, no one need suffer cold or hunger.

In conclusion, the writer ventures to depart from the subject of the paper to express the hope of the Valley that this great catastrophe will awaken the entire country to the realization that the Mississippi River System belongs to the country as a whole and not to the few southern states who have so frequently suffered through its floods, and that the nation, which built the Panama Canal and which counts its surplus funds by the hundreds of millions, will exert every effort to bring this mighty river under control; in brief, the hope and trust that the recent flood has been great enough to be the last one.

Purifying Mississippi Flood Water



Simple Equipment Used

EPIDEMIOLOGIST in the city of Baltimore, Md., V. L. Ellicott, M.D., found that many of the refugees would probably be without satisfactory drinking water on their return to their homes. He, therefore, experimented with the method used at the Montebellow Filtration plant in Baltimore, and found that the addition of one level teaspoonful of alum and one-half level teaspoonful of lime to a bucket of river water, dissolved, stirred for a few minutes and poured through a filter of muslin and absorbent cotton produced a perfectly clear water in a few minutes.

He gave demonstrations to the refugees in the camp and to groups of people living in flooded or partially flooded territory. Instructions, of course, were given for sterilizing the water with chloride of lime or by boiling after filtration.

Dental Hygiene Aspects of the School Health Problem*

HAROLD DEWITT CROSS, D. M. D., FELLOW A. P. H. A.

Forsyth Dental Infirmary, Boston, Mass.

WE ARE greatly indebted to Dr. Rogers † for giving us such a complete picture of the school hygiene activities of the country. While it does not appear to be a serious matter whether school hygiene is done by the school or health department, it is quite evident that one or the other should attend to it, with full coöperation and without interference by the other.

Suitable scientific medical inspection is undoubtedly of great advantage to the school child, and should be carried out as thoroughly as possible until we are able to have most of this work done in the pre-school age. Meanwhile, as Dr. Rogers points out, we must endeavor to keep our figures of "corrections" fairly close to those representing "defects." We must not overlook the responsibility, implied at least, to correct the defects discovered. The statement that "malnutrition is the source of practically all defects" in school children is undoubtedly true, although it is only within a very few years that this idea has been thought to apply to teeth.

Dentistry for children came about in a very logical way as the result of discovering the systemic effects in adults of diseased teeth. When an attempt was made to institute preventive measures for these conditions, it was found they did not yield to such treatment after the disease was established. In order to apply "prevention" it became necessary to get back of the diseased tooth—to reach it before the conditions developed which were responsible for the systemic symptoms. This made it necessary to go back to childhood, even to the age of 6 years or under, for very soon after that age cavities begin to develop.

If no cavities are allowed to develop, no large cavity encroaching on the pulp (nerve) of the tooth can occur, and if the pulp is not encroached upon, there cannot be a dead pulp (nerve), and without a dead pulp there cannot be a tooth "focus of infection," affecting other

* Read before the Child Hygiene Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 19, 1927.

† See Present Status of School Hygiene, James Frederick Rogers, *A. J. P. H.*, Jan., 1928, p. 53.

parts of the body, such as joints, heart, kidney, etc. Therefore, from conditions found to exist by recent scientific investigation, taken together with the results of examinations brought to light by the draft reports of tooth conditions, children's dentistry is the only logical conclusion to be deduced for preventive work.

It took about five years to reach the conclusion that the only way to cure a focus of infection in the teeth was to avoid all the conditions leading up to it, that is, at least to avoid cavities of appreciable size; and several more years were required to bring to the attention of the majority of dentists the fact that the only way to avoid a cavity was to begin before the cavity developed—consequently with a young child.

Dentistry had its beginning as a mechanical trade. The advent of the dental school made it a profession, and the constantly expanding curriculum has gradually introduced the broader scientific attitude; but the profession is still largely dominated by the mechanical influence, and even now its work is still curative and reparative in character. Its growth and progress have been remarkable, but it has made no progress in controlling the occurrence of tooth diseases.

The idea of prevention is not so current even today as it should be, and there are many school dental clinics conducted along the old line of cure or repair for older children—which is not doing any particular good from a public health standpoint, but merely attempting to cure a very small number of defects which should have been economically and preventively treated 7 to 10 years previously. Clinics of this sort are usually advocated by dentists who are educated and trained to do only mechanical repair work, as only recently has the teaching of other measures been added to the dental school curriculum. These clinics in rare instances appear to keep almost up with the development of large cavities—so that after a 3- or 5-year period of work, the number of cavities in the younger children is practically the same as at the beginning, despite the fact that a very large number of fillings have been made for the older children. About the same results are obtained when a program of cleaning only, without any actual dentistry, is carried out. The number of children using a toothbrush, and the number of sets of teeth cleaned, sounds like a lot of progressive work, but no cavity is ever arrested in its development, or any defective enamel pit prevented from developing into a cavity by tooth brushing and cleaning, however beneficial it may be for the morale of the child, or assist in preventing some of the gingival (gum) diseases, such as pyorrhea.

The only dental clinic procedure actually giving results in terms of sound, healthy, lasting teeth, is that of early treatment, immediately after the eruption of the tooth, to care for developmental or organic de-

fects in the formation of the enamel by cutting out these defects and placing small fillings. This plan while not reaching to the point of preventing the defect, does accomplish in a very permanent manner the maintenance of sound teeth structure, not only for the time being, but into adult life, because these little "defects" are the cause of about 90 per cent of cavities and fillings later on—if they do not earlier cause the loss of the entire tooth.

This plan may not eventually prove to be the only or even the best method of conserving the dental organs, but so far it is the only one which has given any actual results in terms of good teeth. It is equally effective whether carried out in the Cleveland School Clinics; by the Association for the Improvement of the Conditions of the Poor, New York City; at Bonn, Germany; or at the Forsyth Dental Infirmary in Boston.

The statistics of Professor Kantorowich who has charge of the organization of school dental clinics, at Bonn, and about fifty other German cities are very enlightening. Kantorowich reports as follows:

Final results at the end of the 8th grade in public schools, 93 per cent with healthy permanent teeth; in (private) high schools at the end of the school term, 93.2 per cent with healthy permanent teeth.

At Forsyth, before the plan was fully worked out and adopted, it was possible to save three to four 1st permanent molars in over 90 per cent of the cases—82 per cent with four 1st permanent molars and 11 per cent with three, in a vital condition at the 8th and 9th grade age; and the extraction of similar teeth, in groups beginning early treatment, was reduced from 33 per cent to less than 0.5 per cent. (See following summary.)

RETROGRESSIVE CHECK-UP RECORD OF BOSTON PUBLIC SCHOOL EXAMINATION OF
6TH YEAR MOLARS—JUNE 1925

Forsyth Dental Infirmary For Children, Boston, Mass.

827	4	6-year molars present	=	82.7%
111	3	6-year molars present	=	11.1%
62	2 & 1	6-year molars present	=	6.2%
<hr/>				
1000	Cases			100.0%

Cases were begun as I-II-III grades.

Check-up was made on an average of 6 years after work was begun.

243 6-year molars were extracted before beginning record.

Teeth extracted after commencing work for group=Primary 8159 + 40 6-year molars and equals 1 6-year molar in every 200 teeth extracted; or $\frac{1}{2}\%$ were 6-year molars.

1914—1 6-year molar was extracted in every 3 teeth extracted.

(50% of 6-year molars were given root canal treatment.)

1925—1 6-year molar was extracted in every 200 teeth extracted in special groups which have been consistently brought for early care. (No 6-year molars were given root canal treatment.)

4 6-year molars were saved in 80% of cases.

3 6-year molars were saved in 11% of cases.

The results have been so satisfactory that the Dental Hygiene Council of Massachusetts recommended to the Division of Hygiene of the Massachusetts Department of Public Health, that this plan of early and immediate treatment be the only one to be officially advised to the various communities of the state in their efforts to carry on a program of dental hygiene. This plan provides for an educational and an operative policy. The American Association of Dental Schools has also taken up this work in connection with preschool children and is endeavoring to have coöperative clinical instruction given to both medical and dental students.

DENTAL POLICY—MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

Division of Hygiene

Endorsed by: Dental Hygiene Council of Massachusetts.
Massachusetts Dental Society.

A widespread need has developed for a consistent and definite policy regarding dental hygiene. This need has been felt by both official and unofficial agencies, by dentists as well as by health officers. The policy outlined below represents the joint decision of the Massachusetts Department of Public Health and the Dental Hygiene Council of Massachusetts in this matter. By a vote of the Massachusetts Public Health Council it is the dental policy of the Massachusetts Department of Public Health.

1—*Educational Policy:*

The Department will supply communities with information concerning the following subjects:

- a. The advantage of beginning dental treatment and nutritional care early, especially of the primary teeth at 2-3 years of age, and the first permanent molar at 6 years of age
- b. The relationship of oral health to general health—benefits of a clean mouth
- c. The relation of nutrition to teeth development
- d. The importance of dental and nutritional care during pregnancy, infancy and early childhood
- e. The evidence of desirability of clinic work, and the desirability of employing a dental hygienist

(Facts will be furnished by Dental Hygiene Council.)

- f. Information as to the visiting and instructive dental hygiene clinic (Directed by the Dental Hygiene Council of Massachusetts)
- g. Cleaning of teeth to be done largely for the benefit of "contact" with the child to create interest in good health habits
- h. Stress the importance of periodic inspection (once a year)

2—*Operating Policy:*

- a. The staff should consist of dentists and hygienists. (Number depends on size of group served.) The dentist to do fillings and extractions. The dental hygienist to teach dental hygiene, clean, examine for fissures and cavities and follow up in the school. (Follow up in homes to be referred to the public health nurse.)

b. Operating Policy defined:

The recommendations of the department as to policy of dental treatment are identical with that carried out at Forsyth Dental Infirmary for Children.

1. Concentrate on preschool children (age 2-3 years) and follow up through the grades, beginning on the lowest until the problem is under control for all grades.
2. Fill all fissures and pits immediately after eruption. Do no "root canal treatment" or conservative pulp treatment.
3. Extract all teeth not amenable to "simple fillings."
(Fill only such cavities as can be done without danger of pulp involvement.)
4. Do only emergency work for children over 7 years of age.

5. Keep records of all teeth extracted that have been previously filled—in order to check up on work of clinic.
6. Discharge children at 13 years of age or after eruption of 2nd molars.
7. Stress the importance of periodic inspection. (At least once a year—oftener if possible if the child is young.)
8. Carry on clinic only so long as it is necessary to introduce and make more attractive and forceful the educational program, cleaning, fillings of fissures and pits, nutrition and dental care for prenatal period and early childhood.
9. Extend clinic service to prenatal cases.

3—The Department offers to communities:

1. Consulting service of dental hygienist
2. Dental educational material:
 - a. Printed Material
 - b. Posters
 - c. Slides
 - d. Exhibits
 - e. Moving Pictures
3. Lecture service to selected groups
4. Assistance in state well-child conferences, stressing nutritional side of dental hygiene and importance of early dental care
5. List of dentists approved by Dental Hygiene Council
6. Details and cost of dental clinic equipment that have been compiled by the Dental Hygiene Council

AMERICAN ASSOCIATION OF DENTAL SCHOOLS RESOLUTION

At the last meeting of the American Association of Dental Schools, the following resolution was passed and a committee appointed to carry it out:

WHEREAS, it is desirable that dental services for children of preschool age be generally provided, and that medical and dental students be brought into closer contact and coöperation when receiving instructions with regard to preventive medical and dental treatment of children from birth to school age, therefore be it

RESOLVED, that this association approves of the establishment of preschool age dental clinics in medical and dental schools, health centres and hospitals throughout the world and that a special committee be appointed immediately for the purpose of conducting and coöperating with other organizations in international propaganda for this object.

This same organization, restricting its activities entirely to the dental hygiene phase of dentistry, and made up of representatives of all of the dental societies of the state, has adopted resolutions, the chief features of which are as follows:

WHEREAS, up to the present the attention of dentistry has been centered mainly on the work of restoring lost dental tissue, the only hope of real progress lies, in the prevention or early control of dental diseases. . . .

Prevention, to be effective, must be applied early in the life of the individual—and early in the life of the tooth. . . . That dental service must begin early and be systematic and periodic in order to obtain the maximum of prevention with the minimum of operative work, and to properly educate the child in habits of oral hygiene. . . . That in the aim to attain prevention of systemic and dental disease—(a) No defect is too slight to receive definite attention. (b) The temporary teeth should receive as much care as the permanent ones, in order to promote the proper development of the jaws and head, and to maintain function. (c) Particular care and attention should be given to developmental pits and fissures, whether occurring in primary or secondary teeth, or whether decay is or is not present. That the Dental Hygiene Council of Massachusetts

declares for the principles and practice of children's dentistry, and maintains that the most effective dentistry that can be done for any individual is the service rendered between the 2nd and 14th years of age.

These principles, in turn, have been adopted by fifteen state societies—the Canadian Dental Society, The VII International Congress, the International Dental Federation and the American Dental Association.

MORE PREVENTIVE EDUCATION NEEDED

In spite of all this interest and publicity, more is needed, for there are still many dentists, just as there are physicians, who do not as yet take much interest in either prevention or such early care, that no treatment of actual disease is involved.

The public, perhaps, is a little in advance of these dentists in their belief in the theory and application of prevention, but they are really further behind than they should be, in what they should know and expect from preventive dentistry or dental hygiene, and much effort will be needed to make this information of practical value.

In the Forsyth Infirmary, all clinical factors of a preventive nature dealing with tooth diseases are carried out to as great an extent as the present status of knowledge permits. Older practices have been given up and new ones adopted as rapidly as some procedure has been found to contain a larger proportion of features of prevention. Prevention is here used in the sense of a real avoidance of a condition or occurrence as it is in medicine, and not the usual dental meaning of merely an improvement in an already established technic or procedure.

The usual and more complicated dental technic is discarded for a very simple type which is all that is needed in caring for the early and simple tooth defects. The lack of complicated technic and the care of extensively and badly broken down cases has frequently been remarked upon, to the exclusion of noticing the continued maintenance of good tooth and systemic conditions, and the avoidance of defects.

In order to accomplish results which are at all preventive in character, it is not only necessary to carry out certain simple technical procedures, but the case must be in a suitable condition to make these procedures possible. This involves chiefly the opportunity to treat the cases *before* conditions have developed beyond a very early stage, and consequently the age of the child is of as much importance as are the clinical procedures. In other words, it is necessary to have both the technic and the time of applying it correlated, in order to obtain the definite advantages which are possible.

The greatest difficulty has been, and is still in getting parents, nurses, physicians, and dentists to appreciate the importance of early attention, so that in any community the age question is more of a problem

than that of clinical procedures, which have been well standardized and put to a successful test.

Large numbers of children, 2 to 3 years of age, are treated to preserve their primary teeth by early treatment of pits and fissures, as it is the aim to fill all cavities within 6 weeks after eruption, whether in primary or secondary teeth. It is not yet possible to do this for the primary teeth to the same extent as is now done for the secondary, on account of the difficulty of getting in touch with children of this age. However, through the baby hygiene and preschool age children's associations, a definite gain is being made each year, although more time probably will be required to place the treatment of primary teeth on a par, in numbers, with that of 6-year molars.

The foregoing plan, while extremely simple and non-technical in character, is giving "end-results" at 16 years of age, in healthy teeth which have had the minimum of dentistry, as early repair work, and the four 1st permanent molars with vital pulps and small fillings are retained. This is a result which technical (orthodox) dentistry has never produced and never can, because it does not aim to prevent, but only to cure and repair.

School dental hygiene is greatly hampered by the lack of preschool work, and many dental defects developing between the ages of 3 and 6 years leave an impression on the child which no amount of school age treatment can undo. It is true that the first permanent or 6-year molar cannot be treated until school age for many children, because it has not erupted, and consequently much of this work must be delayed until school age. However, the primary teeth, in the majority of preschool children are very seriously broken down, and are in as bad a condition as is found in the permanent teeth when uncared for at 10 to 12 years of age.

Inasmuch as under the subject of school hygiene must be considered all of the defects existing at the time of entrance to school life, it appears very logical to include certain preschool hygiene activities which will lead to a reduction of school age defects. This perhaps is not true to any greater extent in dental than in other phases of health defects, but the possibilities of correction in this direction are so great, and the effects both locally and systematically so definite, that such activities cannot be much longer overlooked or neglected.

It has been shown that a large proportion of cervical adenitis and enlarged tonsils are very frequently caused by broken down and abscessed primary teeth, and undoubtedly the first infections, leading later to endocarditis, joint and kidney affections, is often attributable to these serious primary tooth conditions.

Why then, if school hygiene has for its object "to maintain the highest practicable level of health in school pupils," is it not reasonable that school hygiene activity be directed towards the feature (i. e. pre-school correction and prevention) which will simplify the correction of school-age defects—whether this be as actual repair work, or along educational lines.

First grade children require approximately ten times as much work to be done on their neglected primary teeth as upon the newly erupted first permanent molars (6th year). This takes school time and school expense to correct from 6 to 15 large cavities in primary teeth, which might have been done in one-tenth the time and expense a year or two previously. Teachers and nurses complain about this loss of time, yet very few make any effort to have this work done earlier. The difficulty of preschool children not being congregated to facilitate group work, is a complication, but one which could easily be overcome, and at a much lower cost than doing the enormous amount of corrective work after they are in school.

There may be some difference of opinion as to whether prenatal work should logically be included in school hygiene, but some time we may act with sufficient coördination in our health activities to have things done where and when it is necessary to produce results, regardless of who or of what department does it.

Most of the defects (at least 85%) of the primary teeth are produced during the prenatal period and as these teeth are fully formed at birth it is evident that the poor teeth of a child of 5 years, is the direct result of poor prenatal conditions. In turn the poor tooth conditions appearing in the child's secondary set is attributable, to a large degree, either directly or indirectly to the poor primary tooth conditions.

Education in dental hygiene, as in all other phases of the school hygiene problem, is undoubtedly more fundamental and more important than the purely corrective features. The results, to be sure, are always slower than a spectacular correction of defects, but will in time lead to a definite decrease in the necessity for the now excessive corrective procedures.

When parents, teachers, nurses, physicians, and dentists know the possibilities which may be achieved by beginning early and following along each step, beginning with the health of the young people before parenthood, and consequently antedating the prenatal, infant and childhood stages, we shall not need to talk so much about correcting defects, not only dental but all others, as a school hygiene proposition.

Up to within 5 to 8 years, the teeth have been treated in a purely mechanical way and almost as though they were a foreign substance

rather than an actual organ of the body. Also their destruction by decay has been believed to be a local process entirely, rather than dependent upon their vital resistance brought about by the state of nutrition existing in the body as a whole. The ideas now generally accepted by the most advanced among the medical and dental professions really place all of the factors, except their actual repair as a medical problem, and on the same basis as defects and deficiencies of other organs to function properly.

The teeth are, however, peculiar in their response to changes in nutrition, the dental tissue being, so far as is known, the first to respond to a disturbance such as a slight deficiency in certain substances. A few days on a deficient diet shows its result in the structure of developing teeth of pigs and monkeys, and this has also been shown to apply to children whose diet has been very carefully supervised and checked by a control group.

GOOD TEETH RESULT FROM ADEQUATE NUTRITION

It is now an established fact that if adequate nutrition can be maintained during the tooth formative period that good teeth without serious defects will result; also that to maintain these teeth in good health there must be a continuance of good nutrition.

Most of the cavities of children's teeth arise, not in an originally perfect tooth, but in defects of development caused by poor nutrition before eruption. These defects of course develop into cavities through the well known processes of fermentation, fostered by secretions from abnormally functioning glands, upset by the lack of certain food essentials, in addition to the fact that the tooth itself does not receive the necessary nutrient material for the blood stream.

With the present knowledge in regard to the causes and control of dental defects, let us hope that the time is near when the people as a whole shall reap the advantages of this knowledge, and a real modern dentistry will come into general application, so that with our highly civilized development and knowledge our children may grow to adult life with sound and lasting teeth, a set "permanent" not only in name, but in reality.

American Social Hygiene Association Report

A BRIEF summary of the achievements of the American Social Hygiene Association for 1927 has been prepared in mimeographed form for distribution. In 5 pages the research work, aid given to municipalities in their civic house cleaning projects, coöperation with national health groups in stimulating scientific work in relation to the social diseases, the educational program and other activities of the A. S. H. A. are interestingly told.

Chemistry and Health*

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A PROPER consideration of the subject of the relation of chemistry to health necessitates first that we fix in our minds a number of fundamental facts:

1. Human bodies are the most marvelously intricate and finely balanced examples of masses of chemical substances, actuated and controlled by exactly coördinated chemical reactions, which have ever existed or which ever will exist.

2. Life is the highest and most complex expression of the transformation of matter and of the transformation of energy. Chemistry and physics are the fundamental sciences of the transformation of matter and of energy and are therefore the sciences which must ultimately explain and regulate life.

3. The speed with which the complicated and coördinated chemical and physical changes constituting life take place, is of vital importance. Life, in fact, is dependent on the proper fine adjustment of the time relations of a great many interdependent actions in the body; the rate of the heart beat, the rate of respiration, the rate of metabolism, the rate of digestion, the rate of elimination—all matters of physical chemistry.

4. Furthermore, life is dependent upon the maintainence of stability in the colloidal systems which constitute our organs and tissues, the cells of which these are made and the fluids which bathe them—matters of colloidal chemistry.

In short, every breath we take, every movement we make, is the result of chemical changes within the wonderfully organized communities of cells which constitute our bodies. These chemical reactions are so complicated that we understand them but hazily. They, in turn, induce further chemical reactions which we also do not understand. But this much we do know. It is only when these multitudinous chemical changes, which are going on all the time, some with inconceivable rapidity, some more slowly, are proceeding in an orderly fashion that we are in a state of health. When they are abnormal in character or not properly coördinated, they are a direct cause of disease, as in gout, diabetes, goiter, and autointoxication. When abnormal, they may also be the indirect cause of disease through lowering the natural resistance of the body to invading disease germs, which in turn do their damage through the chemical substances which they produce—the toxins.

How much has chemistry done to determine exactly what are the normal constitutions and reactions of the organs, tissues, cells and fluids

* Address of the Chairman, delivered before the Food and Drugs Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 18, 1927.

in the body? In comparison with what remains to be done, it has accomplished very little.

Chemistry has devoted its chief efforts to bringing back to normal, as far as possible, the course of the life processes after they have been disturbed and upset by some agency. Indeed, the very name—chemistry—refers to the land of Chêmi (Egypt) where the science originated in the temples in which priests experimented with simple chemicals for the preparation of medicinals.

For many centuries the connection between medicine and chemistry was so close that in the 16th century the great physician and chemist, Paracelsus, stated: "the true purpose of chemistry is not to make gold, but to produce medicines." It was Paracelsus, you will remember, who introduced into medicine the use of mercury, lead, sulfur, iron, arsenic, copper sulfate and laudanum. Chemists since that time have devised many medicinals to bring abnormally reacting human bodies back to a state of comparative good health. Their contributions to curative medicine have been far larger than have been their contributions to preventive medicine.

To curative medicine the chemist has brought natural therapeutic agents too numerous to mention. He has gone further and improved on nature in many instances by extracting from natural, impure medicinals the pure principles, such as the alkaloids; he has fabricated previously nonexistent medicinals of great value, such as procaine, arsphenamine and many of the sedatives; he has even prepared the pure principles of some of our organs of secretion, such as epinephrine and thyroxin; he has made much progress toward isolating those vitally important principles of our food, the vitamins, to whose lack is due the deficiency diseases.

Truly the investigators in the fields of chemotherapy and nutrition have done much to aid mankind and to further health. As evidence, however, that this work is nowhere nearly finished, I quote Dr. Charles Herty to the effect that the biggest research task confronting chemistry today lies in the field of human health. What are some of these unsolved problems to which he refers?

LINE OF EFFORT STILL TO BE ATTEMPTED

There is a great opportunity to prepare specific medicants for the scourges of tuberculosis, cancer, endocarditis and a host of other diseases. The number of specifics which we have is pitifully small. There are many vital secretions the isolation of whose pure principles could be undertaken with great profit to health.

Another intensive line of effort should be the attempt to isolate the

pure principles of antitoxins, bacterial vaccines and serums, now so much depended upon as to be styled the Big Berthas of curative medicine. The fluids which are now used, valuable as they are, contain, no doubt, only very small quantities of the pure active principles, mixed with large proportions of inert or even harmful matter, and their use is attended with the serious dangers of anaphylactic shock and other complications. That such purification would result in far better therapy is obvious. The isolation of such specifics should be followed by the exhaustive study of structure, revealing the why and wherefore of action, opening up the way to refinement and improvement. This problem is perhaps the very greatest immediate investigation awaiting the attack of chemo-medical research.

Very little has been done toward solving the fundamental problems of physical and colloidal chemistry to which reference was made earlier; the profound study of our time reactions and their regulators; the study of colloids as the basis of investigation of our organs of secretion. Practically this whole field is open and it is a large and important one.

But the very heart of the problem of life, the highest form of chemical change, lies in the deep and complete study of the chemistry of the body cells. This is the most important and also by far the most difficult problem of all. Its solution is vitally necessary for that complete mastery of science over life, which will give man the wisdom to maintain health and to increase the span of life. Herein lies the greatest opportunity of the chemists of the future. Already the trend is in this direction and the work of curing or preventing disease is tending toward a study of the means by which conditions for normal cell processes may be maintained or restored after any disturbance. The importance of increasing our knowledge of the mechanism of the chemical processes operating in the cells of our bodies wherein all the fundamental reactions of life originate and take place, cannot be overemphasized.

While many definite chemical substances have been isolated from human tissues, the identification of which is a distinct contribution to our knowledge of the body cells, no comprehensive and exhaustive study of the contents of even a single type of cell has ever been attempted. Our knowledge of cells from a strictly chemical point of view is scanty indeed. To those who finally elucidate the problems of chemistry and physics in the ultimate field of cell life will fall the honor and gratification of making the greatest contribution of all in maintaining health, preventing disease, and so lessening the need of curing disease.

I have tried to convey to you what I consider is the gravest responsibility and the greatest opportunity of the Food and Drugs Section in the furtherance of the public health. While I do not decry food and

drug control operations, and while I do not seek to minimize the benefits which health in general has received from such operations, I call your attention to the fact that there are other associations than the A. P. H. A. designed primarily to cover the interests of food, drug and dairy control officials. Furthermore, while I shrink from attempting to formulate a policy for future chairmen of this section, I would like to place before them for consideration the proposition that this section can do its utmost for public health by stimulating such research as I have briefly outlined and by securing for its Annual Meeting programs, as far as possible, the presentation of original research along these lines.

NOTE: To those who would pursue this subject more exhaustively, I commend the little book *The Future Independence and Progress of American Medicine in the Age of Chemistry*, published by the Chemical Foundation Inc. from which I drew quite freely and at times almost verbatim in preparing my remarks.

Zoning Progress In the United States

EDWARD M. BASSETT of the Advisory Committee on City Planning and Zoning of the U. S. Department of Commerce and counsel for the Zoning Committee of New York, discusses under the title of "Zoning in the Courts" recent court cases related to zoning.

In brief, Mr. Bassett points out that the constitutionality of zoning ordinances depends upon the question of whether they are reasonable, impartial and based upon the health, safety, morals and general welfare. When these requirements are complied with and the state in which the laws are enacted have Enabling Acts specifically granting to communities the power to zone, when the zone systems are worked out on a basis of careful study of the community's need and development trends and when a board of appeals or adjustment is established with power to vary the strict letter of the ordinance, the chances of such ordinances being declared constitutional are excellent.

In the report on "Zoning Laws and Ordinances" by the Division of Building and Housing of the Department of Commerce, a list is given of the communities which now have zoning ordinances. More than 30 million people comprising in excess of 55 per cent of the urban population of the United States are protected by zoning.—Edward M. Bassett and by the Division of Building and Housing of the United States Department of Commerce.

The Problem of Decolorization

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PROBABLY the greatest lack of uniformity in staining results are met with in such technic as the Gram differential method. While certain organisms can be made to exhibit such a vigorous affinity for basic dye as to be classified always as Gram positive, and certain other organisms exhibit such a weak affinity for the same dye as to be classified always as Gram negative, there is also a large number of "border-line" organisms, the Gram classification of which is somewhat equivocal. It is in the classification of the last type of organism that the characteristics of the decolorizer play an important practical rôle.

For example, the substitution, for the chloroform of Claudius' modification of the Gram technic, of aniline, ethyl alcohol, acetone-alcohol, etc., leads to unreliable results.¹ All of these substances decolorize, but they do not all give corresponding differentiation. Grimme² finds that carbolic acid decolorizes carbol fuchsin stained spores (Kugeln) of *Pseudomonas* species better than alcohol.

In the authors' experience in staining procedure, three factors seem of importance in the choice of a decolorizer. In certain technics one factor is of more importance, and in other technics another.

1. *Solubility of dye in decolorizer*—This factor is generally recognized and is merely enumerated for completeness.

2. *Effect of decolorizing liquid on the pH of the stained tissue*—A basic dye is retained to a much smaller degree in acid than in neutral or alkaline solution.³

3. *The acidic or basic character of the decolorizer, aside from its electrolytic strength*—The alcohols, though ionized to such a small extent as to have practically no effect on the pH of the tissue which they bathe, are nevertheless distinctly acidic in character. This is shown, for instance, by the ease with which certain metals such as sodium or potassium will displace their hydroxyl hydrogen, forming the corresponding alcoholates.

To determine the effect of this character on the decolorizing power of liquids, experiments were made on organisms stained with both acid and basic dyes. The results are summarized in Table I.

Fixed smears of *B. coli*, stained either with gentian violet or acid fuchsin, were found to be easily decolorized by acetone in the absence of any mordant. If the gentian violet stained smear was mordanted with weak sodium carbonate solution, the dye was strongly retained, as shown by the failure of acetone to decolorize, while mordanting with

weak acetic acid solution caused retention of acid fuchsin. *B. cereus* behaved in the same manner except that acetone failed to remove the gentian violet even when no mordant was employed. For each decolorizer studied, therefore, two slides of an organism, either *B. coli* or *B. cereus*, or two slides of each in some cases, were prepared. The one slide was stained with gentian violet and mordanted with weak sodium carbonate solution, the other was stained with acid fuchsin and mordanted with weak acetic acid solution. Neither water nor acetone would decolorize any of the smears thus treated.

The decolorizers which are normally liquids were used directly in the commercially obtainable form. For example, the formaldehyde was the 40 per cent solution, the ethyl alcohol was the 95 per cent liquid, etc. In the cases of the easily soluble solids such as urea, acetamide, etc. (marked (S) in the table), a 10 to 15 per cent aqueous solution was employed, while in the cases of the difficultly soluble solids (marked (S') in the table) an aqueous solution saturated at 50°C. was employed. It was determined that pure water at this higher temperature did not decolorize the smears which were being thus treated.

The general behavior of the various decolorizers seems to be brought out fairly well in the table. Acidic substances apparently tend to decolorize gentian violet stained organisms without affecting the fuchsin stained ones appreciably, while the reverse is true for the basic substances. Although the results may be partly explained on the basis of the established pH effect on the stability of the dye-protein compound which is probably formed during the staining,⁵ it seems highly improbable, especially in the cases of the non-aqueous unbuffered liquids, which, however, show the same behavior as the aqueous solutions, that the selective decolorization is entirely due to a shift in pH. Also, while the relative solubilities of the dyes are different in the different liquids, this fact cannot account for their behavior. In many of the liquids the two dyes studied seem almost equally soluble, and in some cases, notably that of the solution of phthalimide, it was noted that the acid fuchsin was dissolved from the slide much more easily and much more completely than was the gentian violet. In fact it was almost impossible to remove the dye completely from the slide itself. Nevertheless the gentian violet stained organisms were decolorized, whereas those stained with the acid fuchsin retained the stain.

The authors have explained these results to themselves, in accordance with the postulated equilibria obtaining in such systems,⁵ as partly due to mass action effects. Thus in the one case the acidic substances are competing with the acidic bacterial protein, i.e., protein brought to the alkaline side of its isoelectric point by treatment with sodium

TABLE I

DECOLORIZER	IONIZATION CONST. (Approx)	DECOLORIZING EFFECT ON			
		B. COLI		B. CEREUS	
		G. V.	FUCHSIN	G. V.	FUCHSIN.
<i>ACIDIC</i>					
Phenol	10^{-10}	+	—	+	—
m-cresol	2×10^{-8}	+	—	+	—
Phthalimide (S')	5×10^{-9}	+	—	..	..
Methyl alcohol	....	+	— +	— +	— +
Ethyl alcohol	....	+	—	..	..
N.propyl alcohol	....	+	—	..	..
N.butyl alcohol	....	+	—	..	..
N.octyl alcohol	....	—	—	—	—
Benzyl alcohol	....	+	—	..	..
Formaldehyde	2×10^{-14}	+	—	+	—
Acetaldehyde	5×10^{-15}	+	—	..	..
Paraldehyde	....	+	—	+	—
Acetoacetic acid	2×10^{-9}	+	—	..	..
(ethyl ester)					
<i>BASIC</i>					
Urea (S)	10^{-14}	—	+	—	+
Pyridine	10^{-9}	—	+	—	+
Aniline	4×10^{-10}	—	+	—	+
Quinoline	10^{-9}	..	..	—	+
Benzamide (S')	....	—	+	..	..
p-nitroaniline (S')	10^{-12}	—	+	..	..
L'Naphthylamine (S')	3×10^{-10}	—	+	..	..
Caffeine (S')	$< 10^{-10}$	— +	+	..	..
Acetamide (S)	3×10^{-15}	— +	+	..	..
Dimethylaniline	2×10^{-10}	—	+	..	..
(crude)					
<i>AMPHOTERIC OR MIXED</i>					
Glycine (S)		— +	+	—	— +
Alpha-alanine (S)		—	+	—	+
Urea-formalin		+	+	+	+
Urea-acetone-water		+	+	..	..
<i>NON-POLAR. (?)</i>					
Acetophenone		— +	—	..	..
Carbon tetrachloride		—	— +	..	..
Ether		—	—	..	..
ACETONE		—	—	—	—

The ionization constants are taken from Scudder. ⁴ (S) denotes a 10 to 15% aqueous solution; (S') denotes an aqueous solution saturated at 50°C. (—) denotes no appreciable decolorization; (— +) denotes only slight decolorizing effect; (+ —) denotes slight retention of dye while (+) denotes complete decolorization.

carbonate solution, for the basic dye, gentian violet. The preponderant mass effect of the decolorizer over the protein results in comparatively easy decolorization, since the ionization constants of the protein are probably small and of an order of magnitude not significantly greater than those of the decolorizers. In the case of the fuchsin stained tissue we have basic protein, brought to the acid side of its isoelectric point by the acetic acid treatment, retaining the acid dye. Under such conditions there would be no chemical mass effect of the decolorizer, and decolorization would have to depend on the solubility distribution of uncombined dye. Naturally the removal of all uncombined dye by decolorizer would be expected to lead to a certain amount of dissociation of the dye-protein complex, and under any circumstances long continued treatment with any decolorizer will effect removal of stain. Differential decolorization is entirely a matter of relative velocities, and thus in the above work the slides were decolorized until the decolorizer appeared free from stain.

With basic decolorizing agents the reverse conditions hold, and we find the fuchsin stained organisms easily and completely decolorized while the gentian violet is retained.

Even with different acidic substances there is a distinct difference in the speed of decolorization. This has been rather strikingly shown by Kisskalt⁴ in a series of tests on 39 organisms. The decolorizing power of the lower alcohols was studied, and he found that, with the exception of the vibrios and the fluorescent bacteria, practically all bacteria retain gentian violet if amyl alcohol is used as decolorizer. Butyl alcohol decolorizes more strains than amyl, propyl more than butyl, ethyl more than propyl, while methyl shows the widest decolorizing power.

The results in Table I bring out to a certain degree the same fact. When the jump is made from butyl to octyl alcohol all decolorizing effect seems to have been lost. This order is exactly what would have been predicted on the basis of the above explanation, both from the relative molecular concentrations, which decrease with increasing molecular weight, and also from the probable order of acidic strength, which one would expect to decrease with increasing molecular weight,⁵ the heavier hydrocarbon groups having more and more masking effect on the polar properties of the hydroxyl group.

Strictly speaking, caffeine should be classed as amphoteric, but its basic ionization constant is so much larger than its acid ionization constant,⁶ as compared to glycine and alanine, that it is placed with the basic substances. The differential effect is in the same direction as that of the other bases but is by no means so marked.

Glycine and alanine are amphoteric and highly buffered, and it is possible that their effect is largely due to bringing the smears to their isoelectric points, both of which are at a pH of about 6. Either basic or acidic ion is then available for any mass effect. Such a pH is within the isoelectric range of *B. Coli*,¹ though from the pH effect on the retaining power respectively of gentian violet and acid fuchsin as shown by the authors,² the slightly more rapid decolorization of the fuchsin stained smear, as observed, was to be expected. In the case of *B. cereus*, gentian violet is more strongly retained at a pH of 6, which is on the alkaline side of its isoelectric range.

The urea-formalin mixture behaved as expected. When urea is mixed with acetone and a little water is added one would not necessarily predict, from the general behavior, as shown in the table, that the gentian violet stained smear would be decolorized. It is possible that the presence of the urea and water cause a shift to a higher concentration of the enolic acidic form of acetone and that the effect is so produced.

The authors have found that, unless there should be some special reason for the choice, for instance, of a basic decolorizer, as for example for the purpose of obtaining sharp differentiation between a strongly Gram positive and a weakly Gram negative organism, acetone furnishes the most nearly generally applicable decolorizer. While the enolic form of acetone is no doubt acidic in character, as evidenced by the liberation of hydrogen upon treatment with sodium, this form does not seem to be present in the ordinary pure liquid to an appreciable extent, and we have probably a substance which is neither sensibly acidic nor basic. Thus two of the above three factors tend to be eliminated by its use. It is also a decolorizer in which most dyes are sufficiently soluble for effective removal. Such is not the case with either ether or carbon tetrachloride, in which liquids both gentian violet and acid fuchsin are only extremely slowly soluble if they are dissolved at all.

In differential staining methods it is obvious that the dominant factor in the results (and ideally the only factor) should be differential retaining power of the organism for the stain, or if we accept the chemical point of view, the stability of the dye-protein compound. It must be borne in mind that all of the smears prepared for decolorization in this work were prepared under such conditions that the dye-protein compound was, from the point of view of differential staining methods, stable.³ The ideal decolorizer, then, should show this to be the case, but should likewise effectively decolorize smears where such compounds are not stable. Among the common decolorizers acetone seems to come nearer fulfilling these requisites than any other substance tried.

In agreement with the general experience of the authors, Stitt⁸ makes the statement that, as a decolorizer, "acetone is preferred by many due to the fact that it is more rapid in its decolorizing action on Gram negative organisms, yet slower to decolorize positive organisms."

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Health Group to Meet

THE Third New York Health Conference will be held at Hotel Roosevelt, New York, N. Y., February 23-24. The meeting is being arranged under the following official and voluntary agencies:

U. S. Public Health Service
 New York State Department of Health
 New York City Department of Health
 New York State Medical Society
 Milbank Memorial Fund
 Bellevue-Yorkville Community Health Council
 State Charities Aid Association

At this time the State Committee on Tuberculosis and Public Health of the State Charities Aid Association will hold its semi-annual meeting.

The Advisory Council of the Milbank Memorial Fund will also meet to review the work being accomplished in the health demonstrations in Cattaraugus County, Syracuse and the Bellevue-Yorkville district in New York City.

Committee on Administrative Practice*

THE COMMITTEE on Administrative Practice was reorganized and placed on a permanent basis at the Buffalo meeting of a year ago. It is now composed of 12 members appointed by the President of the American Public Health Association to serve for 4-year terms, in overlapping groups, so that 3 members are appointed each year; plus the Executive Secretary of the Association and the 3 officers of the Health Officers section as *ex officio* members, 16 members in all.

The committee, as its work has developed during the past 5 years (with its Field Staff), has come to constitute essentially the technical service division of the A. P. H. A. organization. It appears to have at the moment 3 essential and primary functions. These are:

A. The collection of material in regard to existing health department practice by surveys and questionnaires

B. The critical analysis of the data thus obtained and the formulation of the results of such analysis in the shape of model forms and programs

C. The making available, to individual communities, of the results of procedures A and B by operating an information service and by making on request more or less detailed local surveys and appraisals

A fourth function, that of organized publicity to further the improvement of health department practice by the wider use of the technical machinery now available, has been more or less forced upon the committee; but much of this work will now be shifted to the recently organized Promotion Division of the A. P. H. A. office.

We may conveniently review the work of the past year and the plans for next year under the headings just outlined, although the first two functions, the collection of data and the development from them of model forms and programs, must necessarily be considered together since they are intimately interlocked.

The most important single task, upon which the committee is now engaged is the revision of the *Appraisal Form for City Health Work* under a sub-committee of which G. T. Palmer, Dr. P. H., is chairman. This *Appraisal Form*, which was placed in your hands in January 1926, has exhibited a usefulness beyond our highest expectations. It has been said, and, we believe, with some justice, that no single factor has ever done more than has the use of this *Appraisal Form* to develop city health department practice in the United States; and it has been used to some extent even in foreign countries.

* Report of the Committee, presented to the Health Officers Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 19, 1927.

However, the committee has felt from the beginning that there were two very real dangers in the practical application of the appraisal principle. It might, on the one hand, invite unjustified and damaging criticism of departments having low scores; and it might, on the other, lead to undue standardization and to stagnation on the part of cities having high scores. The first of these hazards has, so far as we are aware, been completely avoided by the use of the *Appraisal Form* in an individual city only with the approval and on the request of the health officer and by the avoidance of any comparison of total scores obtained by various cities on a comparative basis. The second hazard, we have planned to obviate by revision of the *Appraisal Form* at 3-year intervals, and the first revision will be completed during the coming year and presented at the 1928 Annual Meeting. It is planned, not only to alter items in the present form which have been shown to be theoretically and practically unsound, and to increase levels of attainment required for a perfect score to keep pace with current progress; but also, if possible to include certain new items not now included at all. Individuals and organizations interested in mental hygiene and in industrial hygiene, and in the control of heart disease, cancer and malaria, will be asked to submit for their respective fields model administrative programs with appropriate numerical ratings of various activities on an objective basis; and if it proves that such programs and ratings can be prepared they will be included in the 1929 revision.

RURAL COMMUNITIES

A second project, of major importance, is the attempt to extend the appraisal principle to cover the health machinery of rural counties. The sub-committee on this project, under E. L. Bishop, M. D., has prepared during the year a tentative *Appraisal Form for Rural Health Work*. This form was published some time ago and has already been extensively tested out in practice by the committee in Tennessee and to some extent in the states of New York, and Georgia. County or district health officers from 15 states have written to us for 402 copies of these forms, and up to October 1, 1927, 652 copies in all had been distributed. This tentative form will be continued in experimental use till 1929.

In order to proceed soundly with the preparation of programs for rural health work, it seems to us essential that we should have the same broad basis of knowledge which was obtained for city health services in the comprehensive surveys of 1920 and 1923. Dr. Bishop has therefore prepared a definite program for a 2-year study in which 50 typical counties should be surveyed, covering all sections of the country and all

degrees of public health development. He presented this program at the Surgeon-General's Annual Conference of State and Territorial Health Officers last spring. The matter was referred to a committee of the conference on Standard Forms for Reporting County Health Work, S. W. Welch, M. D., chairman. Dr. Bishop's committee and Dr. Welch's committee are now working on the problem with every prospect of hearty agreement. It will be necessary, however, to obtain special funds to the extent of \$25,000 if this work is to be undertaken.

UNIFORMITY OF PRACTICE

In addition to the *Appraisal Forms* which cover in a general way the whole balanced program of community health service, your committee has proceeded actively during the year with the study of certain details of health department procedure which seemed to lend themselves to analysis in the direction of uniformity of practice. Thus, a Sub-committee on Record Forms, with G. C. Ruhland, M. D., as chairman, has rendered a notable service during the year in the preparation, after a vast amount of correspondence and critical study, of sets of model forms to be used in connection with the communicable disease service, the laboratory service, the school medical inspection, and the nursing service of the health department. These 4 sets of forms constitute the second definite evidence of work completed by the committee during 1927. Dr. Ruhland's sub-committee is now proceeding with the preparation of similar forms for use in connection with tuberculosis and venereal disease.

The Sub-committee on Model Health Department Reports, C. Hampson Jones, M. D., chairman, has prepared a preliminary analysis of the functions and contents of a model annual report, a third concrete result of our sub-committee activities presented at this convention. Topical outlines for the various sections of the annual report will be worked out in detail during the coming year.

The Sub-committee on Model Ordinances, H. F. Vaughan, D. P. H., chairman, is at work on a schedule of the main essentials which should be the objectives of a health code, and its final report is promised by the spring of 1928.

An important special problem, that of the relation between the health department and the local hospitals has been considered by a sub-committee, of which Michael M. Davis, Ph. D., is chairman, and his very interesting report giving the results of a questionnaire sent out to 247 health departments and to 1365 hospitals and dispensaries, and supplemented by field visits by our staff, presented at this meeting, will be published later.

The problem of the hospital and the clinic has been forced upon the attention of your committee, not only as coöperating agencies in the primary activities of the health department but, as themselves, in their very essence a part of the machinery for community health programs. We have been called on during the year to make special surveys of the hospital situation in St. Louis and Scranton and have undertaken a study of the dispensary situation in Cincinnati. In order to meet future demands of this kind the scope of Dr. Davis's sub-committee has been enlarged and its title changed to Sub-committee on the Organized Care of the Sick. It has been asked to prepare a suitable survey schedule for the study of hospital and dispensary service and to supervise the field service of the committee in this important field. The work projected will continue to be carried on, as it has been during the past year, in close coöperation with the officers of the American Hospital Association and the function of the sub-committee is limited to the study of hospital and dispensary service in regard to community needs and relationships and will not include details of the construction or operation of such institutions.

Mention should be made of one other sub-committee, that on Analysis of Public Health Procedures, Prof. A. W. Freeman, chairman, which has not been active during the past year but from which we hope much in the future. It is the function of this sub-committee to attempt, step by step, the analysis of the demonstrated values of various community health activities in terms of actual life saving—a problem of enormous difficulty but the solution of which will alone give us the ultimately sound basis for the standards and the appraisals now necessarily grounded in the main on group judgment and empirical experience.

A special sub-committee, with Haven Emerson, M. D., as chairman, was appointed as a result of action taken by the American Public Health Association at Buffalo to present to the American Medical Association the invitation to create a joint standing committee of conference between the two organizations on the inter-relationships between the public health movement and the medical profession. Conferences on the plan have not yet proceeded far enough to require any further official action. Your committee desires, however, to express its feeling that if the American Public Health Association does take part in any such permanent conference committee it should do so through a special committee named by the President of the Association for the purpose and not through the Committee on Administrative Practice.

We may now proceed to a consideration of the third primary function of the committee, the translation of its general program into concrete action through local surveys and appraisals. It is this work which

of course occupies the major share of the time of our very able staff, including Dr. Walker, Dr. Drake and Miss Phillips. During the past year we have made more or less complete surveys and appraisals in Athens and in Clarke County, Ga., Burbank, Calif., Cattaraugus County, N. Y., Chicago, Ill., Cincinnati, O., Fargo, N. Dak., Glendale, Calif., Hingham, Mass., Lowell, Mass., Quincy, Mass., Rutherford County, Tenn., Salem, Ore., Scranton, Pa., St. Louis, Mo., and Syracuse, N. Y., while more or less definite approaches have been made by 11 cities and counties in 7 states and 1 province in Canada for surveys to be conducted in the near future.

We have been invited by the State Health Departments of Michigan and Ohio to undertake studies of their organization and administration, an opportunity which we shall welcome if the necessary funds for this purpose can be obtained.

In the fourth field of activity, that of propaganda for the advancement of the general cause of improved community health services, the committee has opened up during the year two very important possibilities of coöperative effort. The active interest of the U. S. Chamber of Commerce has been enlisted in this cause and three most helpful bulletins have been prepared in the Executive Office on *Prolonging Life by Cooperative Effort*, *Health and Community Prosperity*, and *The Health of the Business Man*, which have been printed by the Chamber and distributed to local chamber of commerce secretaries and to health officers throughout the country. Dr. Walker was also invited under the auspices of the Chamber to deliver a series of lectures on public health before the National School for Commercial and Trade Organization Executives. We believe that local health officers will find the movement thus actively fostered by the U. S. Chamber of Commerce of incalculable value to them in the future.

In conjunction with the American Child Health Association, continued coöperation has also been maintained with the General Federation of Women's Clubs in stimulating a health interest on the part of its constituent organizations.

A schedule of community health study was prepared and 3328 copies distributed to the local clubs, of which 93 schedules were actually filled out by clubs from 13 states. One month's free service was promised by the Committee on Administrative Practice as well as by the American Child Health Association to the state showing the largest proportion of communities participating, and this friendly competition was won by the State of Rhode Island.

The *Health Officers' News Letter* is issued monthly from the office of the committee and is now sent to all state health officers, to health

officers of cities having a population of over 30,000, and to all full-time county health officers.

BUDGET OF THE COMMITTEE

The total budget of the committee for the calendar year is estimated at \$42,000, balanced by an income of about \$19,000 from special grants and general retainers, and \$21,000 from payment for surveys and appraisals, leaving a \$2000 estimated deficit to be made up by the Association. For 1928 we look forward to a basic budget of \$48,000, with \$18,000 more needed if the state and rural surveys are to be undertaken.

The budget of the committee can conveniently be considered under 3 main heads. It includes first of all appraisals and surveys of local communities, which are normally self-supporting. Of the 15 city and country surveys in 1927, 14 were paid for—5 from municipal funds, 3 from funds of local voluntary agencies and 6 from funds of outside voluntary agencies interested in the local health work. This part of our budget takes care of itself and is likely soon to amount to about \$30,000 a year.

Special studies like the rural health survey and the state health survey must obviously be supported by special gifts and will only be undertaken if those gifts are forthcoming.

Finally, there is a basic and essential general service cost of the work of the committee which is and ought to be considerable. All the preliminary work of accumulating data for the various sub-committees, the preparation and revision of *Appraisal Forms*, the preparation of the *News Letter*, the conduct of the Information Service, the aid which must necessarily be furnished very frequently to health officers unable to pay for it—all these things involve a large part of the time of the staff and considerable expenditure for travelling, postage and printing which bring in no direct financial return. We have been able to carry this basic service cost during the past year through a grant of \$10,000 from the Metropolitan Life Insurance Company, a grant of \$7500 from the Milbank Fund, a retaining fee for consultation service of \$1000 from the Commonwealth Fund and a similar retaining fee of \$400 from the Department of Health of the City of Detroit. The indefinite continuation of grants from outside agencies is most unlikely and even with those now available the powers of the present field staff have been strained far beyond a wise and profitable limit. Dr. Walker has rendered to this committee a service of a rare and unusual character and his usefulness grows with the experience of every year. It would be the poorest policy to break down his health or let him slip out of our

hands to some more appreciative organization. We must give him additional assistance, which will require more money, not less.

There seem only 3 ways to finance this general service cost of the committee on a permanent basis: by grants from outside agencies, by grants from the Association, or by contributions from local health departments. Outside grants cannot be relied upon for an indefinite period and Association grants of large size are at present beyond our financial resources. It is really the health departments of the country which profit most directly and most immediately by the work of the committee. The logical source of support would seem to be contributions from these departments just as the source of support for the National Safety Council, which renders to the manufacturing industries a similar service, is found in the contributions of those same industries. If more cities would follow the example of Detroit and place in their annual budgets an item of \$100 to \$500 for consultant service from the Committee on Administrative Practice, our financial problem would be solved in the one really satisfactory way.

C.-E. A. WINSLOW, *Chairman*
HAVEN EMERSON, *Vice-Chairman*
LOUIS I. DUBLIN, *Secretary*
E. L. BISHOP
HOMER N. CALVER
F. G. CURTIS
MICHAEL M. DAVIS
W. F. DRAPER

A. W. FREEMAN
C. HAMPSON JONES
G. D. LUMMIS
G. T. PALMER
W. S. RANKIN
JAMES L. ROBERTS
G. C. RUHLAND
HENRY F. VAUGHAN

REFERENCE

1. Hiscock, Ira V. and Jones, C. Hampson. The Preparation of Annual Health Reports, *A. J. P. H.*, 17, 11 1152 (Nov.), 1927

Babies' Hospital at New York Medical Center

CONSTRUCTION of the Babies' Hospital of the City of New York as one of the units of the Medical Center at 168th St. and Broadway has been begun. This is the eleventh unit to begin construction at the Medical Center since ground was first broken January 31, 1925. The Babies' Hospital will be a 12 story building occupying the site at 167th St. and Broadway. The plant based on the results of a study of babies' hospitals throughout the county will cost about one and a half million dollars, including building and equipment.

Joint Causes of Death*

ANY thorough study of causes of death certified by physicians upon death certificates brings one almost immediately to a consideration of two more causes of death certified for a single decedent. How should joint causes of death be treated?

Assuming for the moment that each death must be assigned to a single cause, how shall these single causes be selected? For several decades it has been customary in most countries to make these selections in accordance with sets of rules—rules not exactly the same in the several countries, but still rules more or less alike—so that the general tendency of such selection has been toward comparable vital statistics.

Regarding joint causes of death it should be pointed out that there are two goals to be kept in mind:

1. Accurate statistics for the United States
2. Accurate statistics for the United States comparable with accurate statistics for other countries

It is not hard to realize that the first goal might be attained, and yet the second goal might be still far away, if the various countries did not compile statistics in accordance with uniform rules of selection. To accomplish anything lasting toward international agreement in the selection of single causes from groups of two or more, representatives of the various countries must actually be convinced by arguments that each selection agreed to is the only proper selection. It will not be sufficient to obtain simply a vote of agreement, for unless the agreement is based on logical facts and definitely stated reasons, the agreement will not be lasting but will probably be superseded shortly by the first clear presentation of the facts of pathology, or clinical medicine, or public health importance. It might be well, therefore, to state a general principle for our guidance in working out this complex international problem:

1. We recognize that it is improbable that the nations will reach complete agreement in thought upon all points related to the reporting and classification and tabulation of births and deaths; and that without agreement in thought, action taken on the basis of a forced decision by a majority vote would retard rather than promote international accord in these matters.

Therefore our objects should be to attain by discussion as much agreement in

* Report of the committee, presented to the Vital Statistics Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 17, 1927

thought as possible, and, when such agreement in thought is not reached, to devise methods or procedures which will permit of the greatest degree of comparability in international vital statistics without doing violence to the convictions of the representatives of the various countries.

In the Bureau of the Census *Manual of the International List of Causes of Death* there are about 8,300 terms which have been used upon death certificates. Assuming that each term may be combined with every other, there are possible about 34 million combinations. Perhaps it would be more reasonable to assume that only one-half of the terms might enter into such combinations. In that case there would be possible about 8,600,000 combinations. To print even this smaller number would require 61 volumes of 1,000 pages each. The magnitude of such a work would be so stupendous that there is little wonder that in the second edition of the *Manual of Joint Causes of Death* (1925) an attempt was made to find a reasonably correct solution by grouping the terms, assuming that all terms in a group had equal weight. It is not claimed that this second edition should be regarded as the last word; many more subdivisions of titles are undoubtedly needed and many readjustments of terms under the various subdivisions; but it is hoped and believed that such changes will lead eventually to a manual of joint causes good enough for the careful compilation of mortality statistics to a degree of reasonable accuracy. It is too much to expect other countries to agree entirely to the selections made for these millions of combinations of causes. The most that we can possibly hope for is that other countries will give careful consideration to our joint cause manual and will publish similar manuals of their own. If such a course is generally followed an excellent start will have been made toward international discussions and toward international agreement.

In the meantime there exists a practical method of making the mortality statistics of the various countries much more comparable than at present. If each country would publish a contributory cause table, such as the Census Bureau did in 1918 and now has in press for 1925, it would be possible to see how joint causes of death are treated in each country and so to work out reasonably approximate figures for international comparison.

It seems to your committee, therefore, that the Vital Statistics Section ought to indorse strongly the following recommendations:

1. That each country publish manuals of causes of death similar to those already published by England and Wales and by the United States.
2. That each country publish a manual of joint causes of death to show how this problem is taken care of in each country.
3. That each country publish contributory cause tables showing the relation of the contributory causes to the principal causes of death.

Eventually, of course, it is to be hoped that the various countries will be able to agree in the main in the selection of single causes from groups of causes, but such a day is far in the future and we believe that more progress can be made toward comparability now, by emphasizing the value of contributory cause tables than by stressing the immediate need of uniform rules of selecting single causes.

The following lines recently received from Malcolm Fraser, Government Statistician of New Zealand, are very encouraging:

The copy of your *Manual of Joint Causes of Death*, which you so kindly sent me about two years ago, has proved of the greatest service in connection with the classification and tabulation of causes of death, and you will be interested to learn that we have adopted it in its entirety.

WILLIAM H. DAVIS, *Chairman*

WILMER R. BATT

GEORGE H. VAN BUREN

WILLIAM H. GUILFOX

JOHN O. SPAIN

Revision of the Appraisal Form for City Health Work

WHEN the Committee on Administrative Practice approved the *Appraisal Form for City Health Work* in 1925, it also committed itself to continued study and periodic revision of the Form with the date of the first revision set for 1929. The sub-committee charged with the revision has already received many valuable suggestions which have been useful in its meetings. However, what the Committee needs now is specific information regarding the application of the existing appraisal form standards to local situations.

Requests have been made to health officers through the *News Letter* to apply the *Appraisal Form* to their particular communities and make this material available for committee guidance. Health officers, so reporting are participating directly in the establishment of standards of service. When he points out those items in which the standards are at considerable variance, the health officer renders a valuable service to the committee, as this information can only be obtained by the study of local conditions, such as was furnished in 1924 by a general survey of all cities.

Workers in other fields will also render assistance by furnishing specific information on standards and values, based upon actual experience and application of the *Appraisal Form*. The committee suggests that those engaged in administrative health work in cities apply the *Appraisal Form* to their local problems and advise the committee of the results.

Who Shall Teach Hygiene in College*

JESSE FEIRING WILLIAMS, M.D.

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SINCE the close of the World War there has been a tremendous interest in health. The teaching of health in school and college has grown rapidly. The spur for this heightened interest has been the reported defects of drafted men, the malnutrition of European children, and the surveys of school children in the United States. This interest, expressed in the organization of departments of health education in schools and colleges, often supplants in the newer terminology that work carried on under the older title of hygiene.

Before this recent development of interest in health, most of the teaching of hygiene was conducted by departments of physical education. In some instances where a doctor of medicine was the head of the department, the hygiene was under medical direction, but often it was taught by those whose training was without any medical background.

This teaching of hygiene by experts in physical education has been varied in its worth. There are some samples of excellent college teaching of hygiene by this group; there are others that are totally incompetent and unsatisfactory.

A recent article in the *Nation's Health* argued that "physical directors are trained to teach exercises and games (and rightly so!) and not to teach preventive medicine or hygiene." The same article further contended that "a thorough biological background and a medical education with special reference to bacteriology and preventive medicine are absolutely essential for the well equipped instructor in hygiene."

Other things being equal, and due correction being made for the emphasis on pathology in the training of physicians, I believe it to be a fair assumption that a man trained in medicine *may* be a better teacher of hygiene than one trained only in physical education. In the long run, however, it is unwise to assume that there will be more successful teaching of hygiene by the former than by the latter. Such assumption leads to positive statements which err grossly in the light of the facts. There are quite as serious hazards when hygiene is taught by a

* This article was written by Dr. Williams in reply to the article, "Is Physical Education Related to Preventive Medicine?" by J. E. Rush, M.D., which was published in *The Nation's Health*, IX, 10:21 (Oct.), 1927.

physician as those presented when it is taught by the physical educator. This may not be apparent to some people because of their lack of information and perspective. One who knows physical education so inadequately that he confuses it with "physical culture" and is so unacquainted with the modern training given to specialists in physical education that he describes their training as consisting of "briefer courses in anatomy and physiology the only subjects in the curriculum that could in any way be interpreted as having a bearing on hygiene," is hardly competent to judge of the relation that physical education bears to the subject of hygiene.

Graduate students who major in physical education in several universities have had courses in biology, physics, chemistry, physiology, anatomy, personal hygiene, educational hygiene, community hygiene, and some have had related courses in anthropology, bacteriology, eugenics, heredity, health examinations, and nutrition.

It is not too much to say that while the physical educator (not physical director) may not have all he requires as a needed background for the best teaching of health, it should also be noted that the physician lacks tremendously in his training. The average medical student gets about the same training in personal hygiene that theological students receive, and this according to a recent study by Storey amounts to what the chemists would call a "trace." The chief criticism of hygiene as taught by the usual physician is that it is academic. Here is a subject that deals essentially with problems of living: to select food properly, to use the body correctly, the rôle of work and rest in bodily activity, sleep, the present facts regarding prevention of disease, measures for developing immunity, personal problems in social adjustment, marriage and race problems, etc., etc. It is exceedingly ambitious for medical men to assume that they have a corner on such information.

One difficulty develops because medical men who have specialized in preventive medicine know so much of the subject that, like all teachers, they tend to develop the subject far beyond its usefulness. A student may learn to shoot a gun accurately without any of the theory involved in the chemistry of explosives or the tabulations of ballistics; indeed, one may become quite skillful in taking pictures and know very little about the science of optics. In like fashion, a student interested in living finely and well may learn how to meet his varied health problems without any lengthy discourse on Theobald Smith's formula on resistance or methods for correcting the crude rate in tabulation of vital statistics. Physicians with limited hygiene training are often of the opinion that prevention of disease should be the cardinal point in health courses. This is unproven. Indeed one study made shows that

students need and are interested in mental hygiene problems, adjustment to modern society, reproduction and mate seeking, physical activity, and nutritional problems. None of these is directly related to prevention of disease. The trouble with many teachers of "preventive medicine" is the academic character of what they teach. It is not a valid assumption that knowledge about disease is of any value *per se* in keeping people well. To say that the purpose of hygiene teaching is "to control sickness and lengthen the useful span of life" is to state a very narrow view. The purpose of hygiene teaching is to help people *to live at their best*. Moreover, ethics, decency and social relationships, comprise related aspects.

If medical men alone are to teach hygiene in colleges, we shall probably have as many errors in advice on how to live as we have now. We shall learn from the experts in preventive medicine who have "a thorough biological background" that development of the skeletal muscles does not strengthen the muscles of the visceral organs; we shall learn that there is an "athletic heart" in spite of McKenzie's work and the experience of expert cardiologists; and we shall learn that "athletic heart" is due to "inheritance or previous disease, or both."

It would appear from some observations and experience that the important factors, granted some acceptable training, to consider in selecting the teacher of hygiene are personal qualifications. The desirable qualities in a teacher of hygiene may be briefly stated in the following divisions:

1. He shall be scientific. Clearly he must not be a faddist. Belief in the efficacy of exercise as a prevention or cure for all things is as unsound as any similar proposal of sorcerer or magician. The faddist in preventive medicine today is subject to the same criticism.

2. He shall not be academically minded. Personal hygiene is a practical matter. The development of knowledge about health is to be evaluated in terms of its practical application. The Goddess Hygeia is a stern goddess.

3. He shall not be a formalist. The learning of mankind has an extended past. Ways of living and methods of procedure have been developed and have attained a certain rigidity of form. But learning how to live *may* be best taught not by traditional methods but by new and untried devices. Reliance upon formal means of education *may* be unwarranted. Experimental attitude, elasticity, and open-mindedness of spirit are very desirable.

Moreover, these qualities are essential if the doctor of medicine is to learn anything about health teaching. Nothing in his medical course prepares him adequately to act as teacher of personal hygiene. The work of teaching today has a technic and a method. It is not sufficient to assume that knowledge of certain material is the *sine qua non* for successful teaching. The operations of the mind in learning, the laws

of learning, the methods to insure greatest retention are not learned in medical schools. Because a physician deems a subject important is no guarantee that it will be so regarded by college students. One teaches only as another learns and the springs of learning are psychological and not medical fiat.

4. He must be a student of human problems. How to select a vocation and to meet vocational troubles, how to select a wife and to regard married life may offer more significant problems in hygiene teaching than a predetermined logical arrangement of eight lectures on immunity.

If it is remembered that the aim in teaching hygiene is to get people to live at their best, the necessity for these qualities will be clear.

In addition, it should be noted that the above discussion has not attempted to answer the question of the allocation of responsibility for health service, or health supervision, or physical education in the college. It has only considered health teaching.

The conclusions, then, are that physicians may be as ineffective as other persons in teaching health; that many persons trained in physical education are adequately helping students to live at their best and therefore teaching health effectively; that the qualities desirable in any teacher of health are a scientific attitude, freedom from the academic mind, open-mindedness, and understanding of life's problems.

Royal Sanitary Institute at Plymouth

THE Royal Sanitary Institute will hold its 39th Congress and Exhibition at Plymouth, July 16-21 at the invitation of the Town Council of Plymouth. The meeting is held to stimulate interest in all public health matters and offer an opportunity to health authorities and to representatives of professional and industrial organizations to discuss problems relating to public health administration. Sanitarians from many countries will be present to discuss the most recent advances in preventive medicine and sanitary science.

A health exhibition illustrating municipal sanitation and domestic health and comfort will be arranged for the delegates.

Any members or Fellows of the A. P. H. A. who expect to be in England at the time of the Congress are asked to communicate with Homer N. Calver, Executive Secretary, 370 Seventh Avenue, New York, N. Y.

Swimming Pools and Other Public Bathing Places*

A COMMITTEE on Swimming Pools was appointed by the Sanitary Engineering Section of the American Public Health Association at the Chicago Meeting in December, 1918. At the first Conference of State Sanitary Engineers at Washington in May, 1920, a similar committee was appointed, two of the three members being also members of the A. P. H. A. committee. These committees have been continued from year to year and since the personnel has always been practically identical, the two separate committees have worked together as one body. At the 1925 meetings the Conference and the Sanitary Engineering Section each voted to unite the two separate committees into a joint committee representing both organizations.

The work of these committees has been greatly facilitated by the continued reappointment of its members. Stephen DeM. Gage, at present chairman of the Joint Committee, has served continuously as chairman of the Conference committee and has been continuously a member of the A. P. H. A. committee since these committees were instituted. George W. Simons, Jr. has also served continuously on both committees with the exception of 1926, and was chairman of the A. P. H. A. committee from its inception until it was merged in the Joint Committee. Harry F. Ferguson has served continuously since 1920. E. S. Tisdale has served continuously since 1922, and C. G. Gillespie has served as a member since 1920 with the exception of the two years 1920-1922. Other present or former members of these committees have been J. W. M. Bunker, 1918-1919, M. C. Whipple, 1918-1920, M. F. Hasbrouck, 1919-1920, Ralph Hilscher, 1920-1923, H. V. Pedersen, 1924-1926, Jack J. Hinman, Jr. 1925-1927, Howard W. Green, 1925-1926, and Richard Messer 1925-1927.

At the time when these committees were instituted the practice as to construction, equipment, and operation of swimming pools varied widely, and only two states, California and Florida, had made any effort to put bathing places under the supervision of the public health authorities. The first work of the committees, therefore, was to collect and disseminate information as to conditions and methods at pools in dif-

* Report of the Joint Committee on Bathing Places of the A. P. H. A. and the Conference of State Sanitary Engineers, presented to the Public Health Engineering Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, Oct. 18, 1927.

ferent parts of the country. Early in its history the committee met the challenge that swimming pool sanitation was not a public health problem by collecting and presenting statistics to show that a considerable number of epidemics of different diseases had been caused by improperly operated swimming pools or by the indiscriminate use of incompletely sterilized bathing suits and towels. In other reports the committee has presented data on the methods of laundering suits and towels, on methods of disinfection of pool waters, on methods and equipment for the prevention of accidents, as well as on a variety of other related topics.

During recent years the committee has received repeated requests to prepare a standard code which might be used as a basis for regulations for the sanitary control of pools and other bathing places. In 1923 both committees presented tentative standards for the physical, chemical, and bacterial quality of swimming pool waters together with certain operating regulations aimed to facilitate the maintenance of such standards. Although these standards have not been formally adopted by either of the organizations to which they were presented, they have become quite generally accepted and as a whole or in part have been incorporated into the sanitary codes of a number of different states and municipalities. In its report to the Conference of State Sanitary Engineers in May, 1926, the Joint Committee recommended tentative standards for the design, construction, and equipment of swimming pools, and in its report to the Public Health Engineering Section (formerly the Sanitary Engineering Section) in the fall of the same year incorporated with these standards the tentative standards of water quality which it had previously presented in 1923. Both organizations after full discussion referred the reports back to the committee with instructions to make such minor corrections and revisions as might be advisable and present a final report on standards for adoption at the 1927 meetings.

The standards as presented represent not only the experience of the various members of the committee, but the consensus of opinion of a large number of sanitary officials and swimming pool operators throughout the country. Swimming pools and other bathing places are now being studied intensively by health officials throughout the country and with advanced knowledge of practical working conditions and new developments in equipment and operating methods, changes in standards of this kind become inevitable. If by setting up standards which are impracticable, or which are either too strict or too lenient our committee has paved the way for better standards and bet-

ter conditions, we may well feel that we have advanced the cause of sanitary progress.

The report to the Public Health Engineering Section, with the standards presented at that time, was published in full in the *American Journal of Public Health* for December, 1926, and reprints of the same have been distributed quite widely. Your committee has had much correspondence with various persons interested in swimming pool sanitation with reference to various sections of these standards, and it appears that no radical changes are advisable. A few minor changes have been made in the wording of certain of the sections in order to promote clarity.

A brief historical preface, together with an appendix * giving illustrations of the method of computing the bathing loads on typical pools, has been prepared for publication with the standards which are finally adopted.

Your committee now recommends the adoption of the standards as printed with the following changes.

Section VI. Add following sentence at the end of section. "An illustration of the computation of the safe bathing load for typical pools is given in the appendix."†

Section XVIII, E. Change wording of section to read as follows. "Sterilization of clear water may be obtained by exposure in thin films to ultra-violet rays. It is claimed by the proponents of this method of swimming pool disinfection that the water after treatment contains a residual disinfecting agent whose action is similar in effect to that which is obtained by the use of a slight excess of chlorine either as gas or in solution. So far as the committee has been able to determine no conclusive evidence has been produced to establish this claim. Until such evidence is produced it must be assumed that disinfection by this process proceeds according to the law of purification by consecutive dilution and is subject to the limitations imposed by that law. On this assumption there is never any definite and determinable amount of disinfectant in the pool water to act on infectious material which may be discharged by bathers during the bathing period at the time when such material is most dangerous. In a few cases satisfactory control of the bacterial content of pool water has been reported by the use of ultra-violet disinfection alone. In a considerable number of instances, however, it has been found advisable to reinforce or supplement the ultra-violet treatment by treatment of the pool with chlorine or hypochlorites. Until reliable evidence is produced that ultra-violet treatment will cause the pool water to contain a sufficient residual disinfectant to take care of casual contamination and until methods have been devised by which any such residual disinfecting action can be readily determined and controlled, the committee cannot recommend the use of violet ray apparatus alone for disinfection of any pool where the bathing load is high or where large temporary loads are likely to occur."

Section XXIV, A. Change minimum excess chlorine required from 0.1 p.p.m. to 0.2 p.p.m., making section read as follows. "Whenever chlorine, calcium hypochlorite or other chlorine compounds are used for swimming pool disinfection, the

* See next page.

amount of available or excess chlorine in the water at all times when the pool is in use shall not be less than 0.2 p.p.m. or more than 0.5 p.p.m."

Section XXV. Add a new paragraph to read as follows: "D. All chemical and bacterial analyses should be made in accordance with the procedures recommended in the *Standard Methods of Water Analysis* of the A. P. H. A. in so far as those methods are applicable to swimming pool waters."

Section XXVII, B. Reword this section to read as follows. "At any pool where the addition of disinfectant is not continuous during the bathing period the total number of persons permitted to use the pool between any two consecutive disinfections shall not exceed 7 persons for each 1,000 gallons of water in the pool and each disinfection shall be sufficient to insure that the bacterial quality of the water shall conform to the limits stated in Section XXV of these standards.

An illustration of the computation of the limiting bathing load is given in the appendix.

STEPHEN DEM. GAGE, (A-C) *Chairman* W. S. TISDALE (A-C)

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APPENDIX I.

ILLUSTRATION OF COMPUTATION OF BATHING LOAD LIMITS FOR A TYPICAL POOL IN ACCORDANCE WITH REQUIREMENTS STATED IN CHAPTERS VI AND XXVII.

Section VI. Estimation of number of bathers who may safely be permitted to use a pool at one time.

Case 1. Assume a pool 60 feet x 20 feet in area, minimum depth 5 feet, capacity 50,000 gallons. No diving board or other specified diving area. Entire area 1,200 square feet is swimming area. Allowing 27 square feet per person (VI, C.) the maximum safe load at one time is $1200 \div 27 = 44$ persons.

Case 2. Assume same pool as Case 1 with a diving board projecting 10 feet at center of one end of pool. As pool is 20 feet wide and 10 feet radius from end of board is reserved for diving, diving area is 400 square feet. Safe limit for this area is 12 persons. (VI, B.) Swimming area is reduced to 800 square feet in which maximum safe load is $800 \div 27 = 30$ persons. Total maximum safe load at one time under these conditions is $30 + 12 = 42$ persons.

Case 3. Assume a large pool, 18,000 square feet area, deep water with one diving tower in center, water depth less than 5 feet on 75 per cent of pool area. The safe load at one time should be computed separately for each of these zones. Diving area may be computed as a circle of 14-foot radius measured from center of tower, with simultaneous diving in each of four quadrants. Diving area = 616 square feet with maximum safe load of 48 persons. Shallow or wading area = 75 per cent = 13,500 square feet in which the maximum safe load is $13,500 \div 10 = 1,350$ persons at one time. Swimming area is 3,994 square feet in which maximum safe load is estimated at $3,994 \div 27 = 148$ persons at one time. The maximum safe load at one time in this pool may be estimated as $48 + 1,350 + 148 = 1,546$ persons.

Section XXVII. Estimation of permissible maximum bathing load limits in relation to water replacement and disinfection.

Case 4. Fill and Draw pools with intermittent disinfection

Assume a pool of 50,000 gallons. Under XXVII, A, $50 \times 20 = 1,000$ persons may use the pool before it must be emptied, cleaned and refilled. Assuming the water supply conforms to the requirements of Section XXV, $50 \times 7 = 350$ persons may use pool after filling before disinfection is required. XXVII, B. After complete disinfection 350 additional persons may use pool before a second disinfection is required. After second complete disinfection 300 additional persons may use pool at which time 1,000 persons will have used the pool and the water must be replaced.

Case 5. Flowing through and recirculation pools

Assume a pool of 50,000 gallons with water being withdrawn and replaced with new or filtered water at a rate of 2,000 gallons per hour. Under XXVII, A, the volume of new clean water being added would be sufficient for $2 \times 20 = 40$ persons per hour or 400 persons during a 10-hour bathing day. If the flowing through or recirculation were continued throughout the entire 24 hours, with bathing limited to 10 hours, there would be an accumulation of $2,000 \times 14 = 28,000$ gallons of clean water during the non-bathing interval or a sufficient amount for $28 \times 20 = 560$ additional persons. The total load on this pool would therefore be limited to $400 + 560 = 960$ persons per day by the clean water requirements.

If disinfection were intermittent the number of persons using this pool between any two consecutive complete disinfections would be 350 as in Case 4. The maximum usage which could be made of this pool in one day under the stated conditions with intermittent disinfection would be as follows: After complete disinfection in the morning 350 persons could use the pool. A second complete disinfection could then be given the pool and an additional 350 persons permitted to use pool. A third complete disinfection could then be given and an additional 260 persons be permitted to use the pool before the volume load limit of 960 persons was obtained.

With continuous disinfection it must be assumed that the pool is in a state of complete disinfection at all times while the excess chlorine is within the limits prescribed in XXIV, A. Under these conditions the rate of water replacement would govern as described above, and 960 persons per day could use the pool.

It will be noted that if the maximum-safe-load-at-one-time rule were strictly observed it would require over 21 consecutive classes of 44 persons each or an average of one class every 28 minutes to attain this maximum in one day. The committee has no sufficient information on pools operated with excessively high bathing loads, and it is possible that the required chlorine content could not be maintained under the extreme conditions stated. It seems probable, however, that if classes were kept within the safety limits specified and the chlorine content maintained within the prescribed limits, the other stated load limits would be unlikely to be exceeded in ordinary practice.

Social Workers To Meet In Paris

TWENTY-ONE nations will be represented at the First World Congress of Social Workers to be held in Paris, July 8-13, 1928. John A. Kingsbury, secretary of the Milbank Memorial Fund who attended a meeting of the organization committee of the Congress in Prague estimates that more than 1000 American delegates will attend the Congress to be held under the patronage of the President of France. The participating groups include the International Child Welfare Congress, International Housing and Town Planning Congress, International Congress of Public and Private Welfare and International Conference of Social Work.

Disposal of Sewage and Industrial Wastes*

THE COMMITTEE'S activities this year have taken the form of brief papers on subjects of current interest, together with the completion of the Definitions, as follows:

Almon L. Fales, Boston, Mass., writes on Progress in the Control of Pollution by Industrial Wastes

W. L. Stevenson, Harrisburg, Pa., on Waterway Sanitation

C. B. Hoover, Columbus, O., on Sludge Disposal

C. M. Baker, Madison, Wis., (although not a member of the Committee) has kindly prepared a paper on The Stream Pollution Problem, showing coöperation in the state of Wisconsin.

Kenneth Allen, New York, N. Y., has completed the Definitions of Terms Used in Sewerage and Sewage Disposal Practice.

Ten years ago a list of 97 definitions was presented by a committee of this section of which George S. Webster was chairman. Mr. Allen was an active member of that committee.

In 1924 a committee of this section was given the task of "Rewriting the Definitions." A reprint of the previous list was sent out to all members of the section and numerous replies were received. Similar action was also secured from the Sanitary Engineering Division, American Society of Civil Engineers. Our committee completed its report and presented it at the section meeting in Detroit 3 years ago. This list consisted of 321 titles arranged dictionary style, to which was appended a Schematic Outline broadly classified under 3 heads:

I. Liquid and Water Carried Wastes flowing in Sewers and Drains

II. The Collecting System

III. Disposal

The A. S. C. E. committee did not present any definitions at that time and its subsequent work was interrupted by the regrettable death of its chairman, Professor George C. Whipple.

This work was later taken up by W. W. Horner of St. Louis, and a committee of the Sanitary Engineering Division, A. S. C. E. Debatable definitions were submitted to many well known engineers and the mass of data was then referred to Mr. Allen, who, from his association with the original committee, his membership in both the societies concerned and his constant and close contact with the subject, was deemed espe-

* Report of the committee, presented to the Public Health Engineering Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 18, 1927.

cially fitted to harmonize the definitions and to prepare the final draught which is herewith submitted. It now consists of 310 titles and a total of 332 definitions.

A duplicate of these definitions was presented by Mr. Horner and his committee at the A. S. C. E. meeting at Columbus, O., on October 13, 1927.

The committee trusts that it has fulfilled its assignment and herewith submits the above mentioned papers and the "Definitions" as its report for the year 1927.

JOHN F. SKINNER, *Chairman*

KENNETH ALLEN

CLARENCE B. HOOVER

ALMON L. FALES

W. L. STEVENSON

Definitions of Terms

Sanitary Engineering Division,
of the American Society of Civil Engineers.

Gentlemen:

Your Committee on Definitions of Terms Used in Sewerage and Sewage Disposal Practice, begs leave to submit its final report as follows:

This committee was first constituted in 1924, under the chairmanship of the late Professor George C. Whipple. Professor Whipple's death came in the fall of 1924, shortly after the submission of a tentative progress report.

At this time, a similar committee of the Sanitary Engineering Section of the American Public Health Association, under the chairmanship of John F. Skinner, presented a report to that section of the A. P. H. A. Both reports were received and the respective organizations instructed their committees thereafter to act jointly until such time as a joint report could be presented for the approval of each society.

In the summer of 1925, the committee of the A. S. C. E. was reconstituted, to consist of Paul Hansen, Theodore Horton, and W. W. Horner, *Chairman*. In 1926 and 1927, the committee has consisted of Paul Hansen, E. Sherman Chase, and W. W. Horner, *Chairman*. During the years 1925, 1926, and 1927, the personnel of the A. P. H. A. committee has also varied, but the chairmanship of Mr. Skinner has been continuous.

In the summer of 1925, the two committees reached an agreement on a plan of joint operation, and on October 19 and 20, a joint conference was held in St. Louis, between some of the members of each committee. At this time all previous lists of definitions were canvassed and the beginning of a new list made up. The list prepared at this meeting was sent out to the members of each committee and was modified quite appreciably by correspondence during the fall of 1925. Agreement was reached with regard to the definitions of the greater number of terms, but there remained a considerable list with regard to which radical differences developed.

In the fall of 1926, the joint committee expanded its membership temporarily by sending to approximately one hundred sanitary engineers, definitions in the alternate of some seventy terms, and received in turn, definite expressions of opinion, from about thirty-five men. With the aid of this assistance, the committee reached conclusions on about two-thirds of the disputed terms.

The work of preparing the final list was then assigned to Kenneth Allen, to whom were furnished full statements covering the differences of opinion still existing. Mr. Allen submitted many of these questions to selected groups of engineers, and arrived at his own conclusions which were again presented to the joint committees for criticism.

Some further revision resulted and finally in September, 1927, the chairman of the two committees reached an agreement that little improvement could be expected by further discussion and recommended the submission of the report in its then existing form for adoption to the two organizations. This action having met with the approval of the membership of the two committees, your committee of the Sanitary Engineering Division of the A. S. C. E. presents the list of definitions herewith,* recommends that it be accepted by the division, and that it be presented for publication by the society.

The committee further requests that it be discharged and that a record be made of the desirability of the appointment of another committee on the same subject about five years hence.

W. W. HORNER, *Chairman*,
PAUL HANSEN,
E. SHERMAN CHASE.

* The Definition of Terms Used in Sewage Disposal Practice, which is the Report of the Joint Committee of the A. P. H. A. and the A. S. C. E., will be published as a manual by the A. S. C. E. Members of the Public Health Engineering Section of the A. P. H. A. will receive copies. Upon request the manual will be available to other members of the Association.

Medical Society of the County of New York

PREVENTION of disease is the general subject of a course of free lectures being given by the Medical Society of the County of New York, Public Health Education Committee, at the New York Academy of Medicine, 1 East 103 Street, New York, N. Y. These lectures, given on the second and fourth Thursday of each month at 4:00 p. m., started on January 12, and will continue until April 26. This course which the public is urged to attend, is given with the full coöperation of the New York Academy of Medicine.

Some of the lecturers on this program are: Beatrice Hinkle, M.D.; George K. Pratt, M.D.; Herbert B. Wilcox, M.D.; Matthias Nicoll, Jr., M.D., Commissioner of Health, New York State; Henry James, M.D.; Richard Kovacs, M.D.; Madge C. L. McGuinness, M.D.; Edward C. Titus, M.D.; Shirley W. Wynne, M.D., Deputy Commissioner of Health, New York City; Colonel Robert Starr Allyn; Harry Hopkins, New York Tuberculosis and Health Association; Aaron S. Blumgarten, M.D.; Rosalie S. Morton, M.D.

On March 22, the lecture will be on "Laboratories in the Diagnosis and Prevention of Disease." Anna W. Williams, M.D., will preside at this session and the lecturers will be Frederic E. Sondern, M.D.; M. C. Schroeder, M.D. and William H. Park, M.D., Director of Laboratories, Department of Health of New York City.

EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

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UNITED STATES PUBLIC HEALTH SERVICE

ANNUAL REPORT OF THE SURGEON GENERAL

THE ANNUAL report of the Surgeon General is always of great interest. For the past two or three years, it has been more complete than ever before, since agreements have been entered into, by means of which we are kept in constant touch with health conditions throughout the world. These agreements also greatly assist our Service in preventing the introduction of contagious diseases into this country.

The two factors which best indicate general conditions for the country, are the total death rate, and the death rate of infants under one year of age per 1,000 live births. For 1926, the death rate for 28 states was 12.1 per 1,000 population, slightly higher than for 1925, apparently as the result of the large number of deaths from respiratory diseases. The infant death rate for 28 states was 72.8, also a little higher than the rate for 1925; but only 10 years ago, it was approximately 100 per 1,000 live births. There was a general decline in the death rate from most diseases. In Europe there was quite a severe epidemic of influenza, which fortunately did not reach this country, and in Asia there was a large amount of cholera, that country still being the home and hotbed of the disease.

In 1916, the late Dr. Guit  ras pointed out that the greatest danger of the tropics to other countries was bubonic plague, and this warning was repeated in a report of the Surgeon General several years later. During 1926, it has shown a decreased prevalence, but is still one of the greatest menaces which we have to face. Approximately nine-tenths of the cases for the year have been in India.

All of us can remember when the name yellow fever made us shudder. Lately it has been confined to one small part of Africa, and during 1926 a single case was reported from Brazil. No case of cholera, yellow fever, or plague gained entrance to the United States during the year,

though 2 cases of plague, 17 cases of smallpox and 2 cases of leprosy were detected at the port of entrance, but got no further. Plague still exists among rats and ground squirrels in certain parts of California, and compels constant watchfulness.

Smallpox decreased, but it will astonish many to know that more than 30,000 cases were reported from 41 states. We cannot but believe that physicians depend too much upon a single vaccination. Revaccination should be practiced at regular intervals in childhood, and whenever a person is exposed to the disease. If a successful take does not result, the operation is painless; if a take does occur, it is evident that the patient needed it. Nothing in connection with medical science is better known than the fact that vaccination with revaccination will obliterate smallpox.

The examination of incoming vessels continues. Twenty thousand, two hundred and eighty-four vessels, with 820,793 passengers and 1,140,922 seamen were inspected at domestic ports, and a large number at insular ports. One of our best safeguards is the inspection at foreign ports of vessels and passengers bound for the United States. Five thousand, nine hundred and fifty-four vessels, 424,172 passengers and 272,873 seamen have been inspected for the year in this service. Seven thousand, one hundred and sixteen vessels were fumigated on account of disease or for the destruction of rodents, and more than 31,000 rats were found, 18,000 of which were examined for plague.

Perhaps the most discouraging feature of the report is the high prevalence of venereal diseases among patients treated by officers of the Service. This has averaged 20 per cent for many years, and for 1926, was 17.

Apart from the purely medical subjects reported upon, the most important features are two conventions, one held in Paris, attended by the representatives of 60 governments, to revise and improve existing treaties regulating maritime commerce, and the other, a conference held in Washington of the Pan American Governments, for the formulation of a constructive program in matters pertaining to public health and sanitation.

ALASTRIM A FORM OF SMALLPOX

IT HAS been widely held that the general adoption of vaccination against smallpox has led to a modification of the disease, so that mild cases now occur, which otherwise would have been severe. Difficulties in diagnosis have arisen owing to this fact.

Others have held that there are two types of smallpox; one mild and one severe, and numerous theories have been advanced to account for

the differences between the two. The matter has been quite fully discussed by Dr. Chapin,¹ who rejected many of the theories which have been advanced, and who holds that there is a clear distinction between the severe form and the mild form, pointing out that the two types have existed together, and that it has been impossible to stamp out the mild form, in spite of rigorous isolation and vaccination. Furthermore the two types breed true. In the United States it has prevailed for upward of thirty years, while the classical and severe type has been comparatively rare. England has had a number of outbreaks of both types during the past twenty-five years.

More recently our attention has been called to a disease known as "alastrim," which also goes under the following names: amaas, varicoid, varicella, Kaffir milk pox, Sanaga pox, the Australian disease, Cuban itch, Philippine itch, etc. This has been held by some to be a distinct disease, though our Public Health Service has consistently maintained that it was a type of smallpox. A long series of experiments just reported by our Public Health Service has demonstrated that a "definite cross-immunity exists between alastrim and mild smallpox," as well as between alastrim and vaccine virus.

A number of experiments have been carried out on monkeys and rabbits, and the conclusion seems inevitable that alastrim is a type of smallpox, and should be treated as such.

REFERENCE

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THE NUTRITIVE VALUE OF OLEOMARGARINE

A STATEMENT concerning the food value of oleomargarine seems necessary in view of what was said in the abstract section of our issue of October, 1927, in which it was stated: "Oleomargarine is of no value for any nutritive purpose," this opinion apparently having been based upon a previous statement that "oleomargarine is practically devoid of vitamins." These pronouncements are obviously not supported by the fact.

Broadly speaking, there are two types of oleomargarine on the market, one which is made largely from animal fats, and one from vegetable fats, such as cocoanut oil, cotton seed oil, etc. It is therefore inaccurate to speak of oleomargarine without stating which type is referred to. However, it can be said with certainty that all oleomargarines have a food value equal to that of their constituents. The nutritive value of a substance is not entirely dependent upon its vitamin content. If we accept the vitamin content as a standard, we shall be obliged to dis-

card many of our most valuable food stuffs, such as wheat flour, sugar, lard, etc.

Rosenau¹ correctly says, "Since all of the ingredients are in themselves useful foods, the wholesomeness and nutritive value of the finished product is beyond question." He further states the well-known fact that oleo oil is a recognized source of vitamin A; and various studies by men such as Osborne and Mendel, Halliburton and Drummond, Steenbock and his associates, and a number of other investigators, have shown that the animal fats from which oleo oil is made, as well as the oil itself, contain varying, but often large amounts of vitamin A. Steenbock,² Hoagland and Snider,³ and others have shown that the color of the fat and its vitamin content bear some relation to each other, those which are most pigmented being generally the richest in vitamin A. Osborne and Mendel have shown that the oleo oil contains practically all of the vitamin A present in the beef fat from which it was made, leaving very little in the oleo stearin, which is used chiefly in the preparation of baking compounds. The "yellow oil" prepared from fats derived from grass-fed cattle, generally runs highest in vitamin A.

An examination of twenty-four specimens of oleo oil collected from various parts of the United States, from Denver and Fort Worth on the west and south, St. Paul on the north, and New York on the east, have shown that the yellow oils are much the richest in vitamin A, a ration containing 10 per cent of this grade frequently producing normal or very nearly normal growth in rats.⁴

Some oleomargarines contain butter fat, which is intentionally added, and it is the general practice to churn oleomargarines in milk. Recently some manufacturers have been adding vitamin A. The process is said to be a trade secret, but it has been suggested that cod liver oil or other substances notably rich in vitamin A are used. The fact is that at least one of these products, although made from vegetable fats, has been constantly improving, and recently has shown results in experimental animals better than those produced by butter.⁵ The Medical Research Council⁶ of England rates oleomargarine made from animal fats other than lard, from + to + + . Cod liver oil and some other fish oils very rich in vitamin A are rated + + + .

There is no question that butter is one of our richest and most dependable sources of vitamin A, yet, without known exception, authors state that the content is variable and apt to be very deficient in the butters produced in late winter and early spring. It has been shown that cows can be maintained in apparently good health for long periods on a diet practically devoid of vitamin A, and produce milk, and consequently butter, which is very deficient in this substance.

Numerous experiments have shown that oleomargarine is equally as digestible as butter, is palatable, and keeps much better than the poorer grades of butter. The animal fats from which it is made are subject to federal meat inspection, and only the fats from animals which have been passed by our government officers can be used in its preparation. We are therefore assured of its entire wholesomeness. On the other hand, any dirt, rancidity or extraneous flavors make the fat unsuitable for the manufacture of oleomargarine.

In the manufacture of the vegetable fat oleomargarines, which do not come under the Meat Inspection Service, pasteurization of the milk and other dairy products used is regularly practiced.¹ The late Professor Harrington,² of Harvard University, said that oleomargarine has been misrepresented to a greater extent than probably any other article of food, and pointed out that it was made only from the cleanest materials and in the cleanest possible manner; that it was equally as wholesome as butter, and that when sold for what it is, and at the proper price, it brought into the dietary of those who could not afford the better grades of butter, an important food fat. We know of nothing which justifies a modification of this statement. The increased use of the vegetable oils and our newer knowledge of the importance of vitamins, make it necessary to supplement margarines with good whole milk, or other vitamin bearing foods. If the practice of adding vitamins, above mentioned, becomes general, even this precaution will not be so urgent.

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ASSOCIATION NEWS

CENTRAL PROGRAM COMMITTEE

THE first meeting of the Central Program Committee to arrange for the scientific program of the Chicago Annual Meeting, to be held October 15 to 19, will be held February 11. All members and Fellows of the Association who expect to offer papers for the Chicago program are urged to communicate without delay with their respective section chairmen or with the Executive Secretary of the Association, Homer N. Calver, 370 Seventh Avenue, New York, N. Y.

In past years it has been necessary to close the program two months or more before the Annual Meeting and as a result it has been impossible to accept valuable papers offered at the last moment.

The Program Committee is interested in having contributions from new authors and accounts of new work which has not been reported elsewhere. The presentation of papers is limited to fifteen minutes (3000 to 5000 words) and each author is expected to furnish a copy of his manuscript, or an abstract of it, in advance of the meeting.

The Hotel Stevens has been selected as headquarters for the meeting and according to present plans all sessions and exhibits will be held in this hotel.

Five hundred rooms and baths at \$3.50 for single occupancy have been reserved for members and Fellows of the Association. Those who make their reservations too late to secure one of these rooms can be assured of accommodations at \$4.00 per day. In making reservations for the purpose of the meeting it is essential to indicate the date of arrival. Accommodations will be assured if those making the reservations will state that they are members of the American Public Health Association

DR. WALLACE WITH THE A P H A

JAMES W. WALLACE, M. D., Deputy Health Commissioner of Iowa has been appointed Associate Field Director for the Committee on Administra-



James W. Wallace, M D

tive Practice, and will assume his duties with the Association on February 1. He will be engaged in making surveys and appraisals of health work.

Dr. Wallace has had extensive experience in public health work. He obtained his M. D. degree from Queens University, Toronto, later taking graduate work at the Rush Medical College, University of Chicago and the Mayo Clinic, Rochester, Minn., and the Crile Clinic, Cleveland, O. He obtained a Certificate of Public Health from Massachusetts Institute of Technology and Harvard University.

Dr. Wallace served for 4 years with the University Hospital Service in Egypt, England and France, and during the World War was awarded the Mons

Medal for service with the Canadian Forces.

He has been associated with the International Health Board, having been appointed to the state health programs conducted by the Board in North Carolina, Alabama and Virginia. Before being appointed Deputy Health Commissioner of Iowa, which position he has occupied for the last 2 years, he was director of rural health organization of Iowa and was State Epidemiologist in Utah. His outstanding piece of work in Utah was the extensive goiter survey.

COMMITTEE ON ADMINISTRATIVE PRACTICE

THE public presentation of the report of the St. Louis health and hospital survey, made by the Field Staff of the Committee on Administrative Practice, was made to the local committee in St. Louis on January 9. Public meetings were also held at the Chamber of Commerce and before the medical society for the presentation of the public and professional aspects of the study. Haven Emerson, M.D., as consultant, presented the report dealing with the facilities for the care of the sick.

The annual health examination of the Child Health Demonstration Areas of the Commonwealth Fund has been begun by the appraisal of the services in the city of Fargo, N. D. Studies of Athens and Clarke County, Ga., and Rutherford County, Tenn., the two southern demonstration areas, will be carried on during February.

The Field Staff of the Committee on Administrative Practice will spend some time during February in Montreal where it has been called in as consultant in connection with a survey and appraisal of health activities being carried on by the Montreal Anti-Tuberculosis and General Health League in coöperation with the Health Officer.

Two important sub-committees of the

Committee on Administrative Practice met during January. The Sub-committee on Analysis of Public Health Procedure, Allen W. Freeman, M. D., *Chairman*, has as its function the analysis of demonstrated values of various community health activities in terms of actual health saving—a problem of enormous difficulty, but the solution of which will alone give us the ultimately sound basis for the standards and the appraisals now necessarily grounded in the main on group judgment and empirical experience. The personnel of this committee includes: Henry F. Vaughan, D.P.H., Geo. T. Palmer, D.P.H., Geo. C. Ruhland, M.D., Lowell J. Reed, Ph.D., Edgar Sydenstricker.

The Sub-committee on Model Health Ordinances spent two days in a discussion of essential items to be written into the basic legislation of a health department. This committee does not expect to put its material into standard legal form. It contemplates an outline of those items which should be put into the basic laws and those which should be written into a sanitary code or other rules or regulations adopted by the health department. Henry F. Vaughan, D.P.H., as chairman, is assisted by Haven Emerson, M.D., Huntington Williams, M.D., and James A. Tobey, Dr. P.H., in this work.

A survey of city and county health activities in Spartanburg, S. C., was completed in January by C. St. Clair Drake, M. D., Field Associate, Committee on Administrative Practice.

THE Local Committee for the 57th Annual Meeting of the Association, to be held in Chicago the week of October 15, 1928, is being organized, with Professor E. O. Jordan as Chairman, and Arthur E. Gorman, Secretary.

THE committee authorized to direct a census of public health workers has been appointed. It is composed of Ar-

thur E. Gorman, C. E. Turner, John F. Norton, George H. Van Buren and John L. Rice. The first meeting of the committee will be held in the Executive Offices February 10.

THE second public health conference called by the American Medical Association will be held March 30-31 at A. M. A. headquarters in Chicago. The A. P. H. A. has been invited to be represented at this conference.

WILMER R. Batt, M.D., Field Representative for the Committee on Registration Area of the A. P. H. A. is now working in Texas, with headquarters in Austin.

DEATH OF PROFESSOR JAMES O. JORDAN

PROFESSOR James O. Jordan, Milk Inspector of the Boston Health Department, died on January 6, 1928, at the New England Baptist Hospital.

Professor Jordan was born in Lisbon, Me., May 26, 1864. After graduation from the College of Pharmacy, he was appointed, in 1884, a chemist in the Bureau of Milk Inspection of Boston. He held this position for 21 years and was then promoted to the position of Milk Inspector. For several years he taught at the college and became a life member of its Corporation. He was Secretary of the Section on Food, Drugs and Nutrition of the American Public Health Association, a member of the Executive Committee of the Massachusetts Association of Boards of Health, a member of the Boston Medical Milk Commission, a member of the Massachusetts Milk Inspectors Association, as well as a member of several other associations, and belonged to the Fraternal Order of Elks.

Professor Jordan devoted much of his life to the enforcement of milk laws and was a pioneer in the cause of milk legislation. He was the author of many papers on the different phases of the milk problem and is widely known for his work.

In his service to the section he was dependable, capable and faithful. He was quiet and unassuming in manner. In one of his last letters he recommended that committees be made small in membership for effective work, and he heartily endorsed the idea that we want "facts, not opinions." He will be missed from the work of the Association. His long affiliation with us and his close identity with the work of the Food and Drugs Section as Secretary, since its establishment in 1916, gave him an intimacy with the work and an acquaintance with details that were highly valuable to the successive chairmen. An old timer has passed on. The cause of public health has lost one of its best workers.

LETTER TO THE EDITOR

TO THE EDITOR:

In promoting vaccination, and more recently, in promoting immunization against diphtheria, health officers have frequently fallen into the blunder that Jenner himself committed when he claimed for the prophylactic treatment much more than facts would warrant.

It seems to me that the progress of the movement to adopt immunization as routine practice is hindered rather than helped by such extreme statements, since it leaves the practice open to valid criticism on the part of opponents, who need only a few dramatic exceptions to discredit the principles advocated by health officers. I am writing you now because I have just noted an exceptionally bald statement from the health department of one of our better cities:

Every child after the age of six months should be protected against diphtheria. The treatments are safe. They cannot possibly do the child harm, and once the immunity against diphtheria has been developed by means of toxin-antitoxin, it insures an absolute protection for life.

One can accept the conclusions—that is, the advisability of immunizing every

child after the age of six months—but is it sound public education to rest the case on the assertions that follow? When Dr. Stewart in Minnesota, or some other student, points out the dangers in allergic reactions, the anti-vivisectionists and anti-vaccinationists have enough material to discredit the whole program. My answer would be, not the silencing of Dr. Stewart, but the challenging of the reckless claims made by public health officers. The health officer or the physician who administers toxin-antitoxin ought to know that such treatments “are safe”; but he ought to know also that they *can* do the child harm under certain conditions, although the careful technician knows how to recognize the danger in most cases. Moreover, it is utter non-

sense to talk about insuring *absolute* protection, and that *for life*.

Would it be asking too much of you to write an editorial in the AMERICAN JOURNAL OF PUBLIC HEALTH on the danger of abusing the ignorance of the public or the credulity of the public, whether by quacks or by sincere public health officers? There is in any case no use in putting weapons into the hands of your supposed enemies.

Sincerely yours,

BENJ. C. GRUENBERG,
Managing Director.

American Association of
Medical Research,
New York, N. Y.,
November 29, 1927.

NEW MEMBERS

- A. Faith Ankeny, R.N., Des Moines, Ia., (Assoc.)
- Mary Elizabeth Ayer, R.N., Northampton, Mass. Public Health Nursing Consultant, Division of Hygiene, Mass. State Department of Health.
- Berkshire Life Insurance Company, Pittsfield, Mass. Sustaining Member.
- Wescoat Adalbert Black, A.B., M.D., Dillon, S. C. County Health Officer.
- James Andrew Britton, B.S., M.D., Chicago, Ill. Medical Service, International Harvester Co.
- Herman Jacob Brueckner, B.S., Cincinnati, O., Milk and Dairy Inspector, City Health Department.
- Harry M. Bulbrook, M.A., in Sc., Fort Worth, Tex.
- Nina Fay Calhoun, M.D., Dallas, Tex. Director of School Health Department, Dallas Public Schools.
- Dottor Carlo Cerruti, Turin, Italy. Assistant to the Professor of Hygiene, Royal University, Turin, Italy (Assoc.)
- Nathan Civen, B.A., Concord, N. H., Chemist, New Hampshire State Board of Health, Food & Drugs Division
- Ethlyn Cockrell, St. Louis, Mo., Itinerant Public Health Nurse, American Red Cross
- Charles S. Curris, M.D., St. Anthony, Newfoundland. Medical Officer in Charge, International Grenfell Association, Inc.
- Charles Edmund De Leuw, B.S., C.E., Chicago, Ill. Consulting Sanitary Engineer.
- Dorothy Deming, A.B., R.N., New York, N. Y. Assistant Director, National Organization for Public Health Nursing
- Mary Grace Dodd, R.N., Jacksonville, Fla. Bureau of Child Hygiene, State Board of Health.
- Charles U. Duckworth, D.V.M., Sacramento, Calif. Chief Bureau of Dairy Control, State Department of Agriculture
- Gideon J. Ferreira, B.Sc., M.D., Duluth, Minn. Health Officer, St. Louis Co.
- Forest Fletcher, Lexington, Va., Professor of Hygiene and Physical Education, Washington and Lee University.
- Marjorie L. Foster, B.S., Boston, Mass., New England Dairy and Food Council
- Henry B. Freiberg, M.D., Cincinnati, O. Department of Health (Assoc.)
- Jule Oleander Graves, Jacksonville, Fla. Staff Nurse, State Board of Health, Fla.

- Fred B. Green, D.V.M., Lufkin, Tex., Field Supervisor, State Board of Health
- Esther F. Greene, A.B., Providence, R. I., General Secretary, R. I. Society for Mental Hygiene
- Isabel Pauline Haggerty, B.S., M.A., Passaic, N. J. Health Science Instructor, Passaic Public Schools
- Clyde R. Harvill, Charlotte C. H., Va., Sanitary Officer, Charlotte Co., Va.
- William Howard Haskell, D.V.M., State Health Department, Nashville, Tenn.
- Jeanette M. Hays, Milwaukee, Wis., Registrar, Wisconsin Nurses Club & Directory
- Dr. Xavier Hernandez, M.D., Mexico City, Mex. Department of Public Health
- G. O. Higley, Ph.D., Delaware, O., Health Commissioner, Delaware City District
- Donald Hoddd, M.D., Harrington Hospital, Saguenay Co., Canada. Medical Officer in Charge
- Horton & Converse, Los Angeles, Calif. Sustaining Member
- J. R. Jennings, B.S., Phoenix, Ariz. State Dairy Commissioner
- Florence B. Karpowicz, R.N., Buffalo, N. Y. School Nurse, Bureau of Child Hygiene
- Eloise Adele Kennedy, Kansas City, Mo., Housing Inspector, K. C. Consumers' League
- Charles Glen King, Ph.D., Pittsburgh, Pa., Assistant Professor Sanitary Chemistry, University of Pittsburgh
- Moses T. Knappenberger, Warren, O. Health Commissioner
- Ida M. Lewis, R.N., Brookline, Mass., Instructor in Health, Public Schools
- Frank Light, M.D., Ottawa, O., Health Commissioner, Putnam Co. General District
- LeRoy M. A. Maeder, M.D., LL.B., Philadelphia, Pa., Acting Medical Director, Pa. Mental Hygiene Committee
- Emma Jane Mange, Kingston, Mass. Public School Nurse
- Philip E. Marks, M.D., Pittsburgh, Pa., Superintendent Bureau of Infectious Diseases, Dept. of Public Health
- Carl Martin, Jacksonville, Tex. State Sanitarian, State Board of Health
- Hector Clive McAlister, M.D., Fort Wayne, Ind. Medical Director, Lincoln National Life Insurance Company (Assoc.)
- Clio McLaughlin, Jacksonville, Fla., State Rural School Nurse, State Board of Health
- Charles F. Mebus, Glenside, Pa., Civil Engineer
- Herman Moret, M.D., Battle Harbor, Labrador. Medical Officer in Charge, International Grenfell Association, Inc.
- Marion Parks Morse, R.N., Oyster Bay, N. Y. In Charge, Oyster Bay Visiting Nurse Association
- Louise M. Murphy, Lincoln, Neb., Director, Division Child Hygiene, State Bureau of Health
- The National Kraut Packers Association, Inc., Clyde, O. Sustaining Member
- Lockhart Nelson, Hillsboro, O., Health Commissioner
- Anna M. Neukom, B.A., R.N., Binghamton, N. Y. School Nurse
- Laura Cowan Niblock, R.N., Jacksonville, Fla. State Board of Health Rural School Nurse
- Harold Watson Nightingale, S.B. M.S., Seattle, Wash., State Sanitary Engineer.
- Henry Locke Paddon, M.A., North West River, Labrador. Medical Officer, International Grenfell Association, Inc.
- Charles Whitaker Pemberton, M.D., Houston, Tex., Supervisor of Hygiene, Public Schools of Houston
- Jean Pinckney, M.A., Austin, Tex., Chief of Bureau of Nutrition & Health Education, University of Austin
- William T. Pratt, M.D., Rockville, Md., Deputy State Health Officer
- Phyllis Comyn Radford, M.A., Chicago, Ill., Director, School Health Service, The Quaker Oats Company
- Winifred Rand, A.B., Detroit, Mich., Chairman, Central Bureau of Nursing
- Benjamin B. Robbins, M.D., Bristol, Conn., City Health Officer
- H. R. Ross, M.D., Sterling, Kans., with City Board of Health
- Anna L. Scherff, R.N., St. Louis, Mo., Staff Nurse, Municipal Nurses
- Adelaide Ross Smith, M.D., New York, N. Y. Assoc. Professor in Medicine in Industrial Hygiene, College of Physicians & Surgeons, Columbia University
- Robert G. Snyder, B.A., Sioux City, Ia., Laboratory Technician, Board of Health
- Willard B. Soper, M.D., West Haven, Conn., Assistant Medical Director, William Wirt Winchester Hospital
- Finis Suggett, M.D., Columbia, Mo., County Health Officer
- Dr. Alcixo de Vasconcellos, Medical Professor of Bacteriology, University of Rio de Janeiro, Brazil, S. A.
- Fred E. Vetz, B.S., Jersey City, N. J., Inspector of Foods, Department of Health, New York, N. Y.
- S. O. Von Achen, Jefferson City, Mo., Sanitary Inspector, State Board of Health
- Helen E. Whiting, Buffalo, N. Y., Executive Department of Health Education, Y.W.C.A.
- Robert E. Winkler, Cincinnati, O. (Assoc.)
- Elsie Witchen, R.N., Washington, D. C., Demonstration Nurse in Maternity & Infancy Hygiene, Children's Bureau

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

The Health of the School Child—
Sir George Newman, in the *Annual Report of the Chief Medical Officer of the Board of Education* (England) for the year 1926, recognizes two common types of ill-balanced children; (1) the catarrhal child, in whom there is a tendency towards hypertrophy of the lymphoid tissue and a special susceptibility to inflammatory exudation from mucous surfaces and (2) neuropathic child, who shows a lack in nervous regulation of the whole body with atony of the muscles, the weight of the body being balanced by stance rather than by muscular action.

The author recommends that the following queries regulate the status of the abnormal child: (1) Is the debility due to general nurtural neglect in the child's home—insufficient sleep, inadequate and irregular meals, or vitiated atmosphere? (2) Is the debility the manifestation of some particular disease such as tuberculosis, rheumatism, or rickets? (3) Is it the after-effect of recent illness, measles, or broncho-pneumonia? (4) Is it an early sign of some oncoming disease? (5) Is it due primarily not to bodily disease, but to neuropathic or psychopathic disease?

The Problem of Goiter—The London *Lancet* for December 10, 1927, gives an interesting resumé of the International Conference held in Switzerland last August on the problem of goiter. In discussing the etiology and epidemiology of the subject McCarrison still insists that goiter is a syndrome including a great number of conditions of various origin. For endemic goiter—

He finds the pathogenetic explanation in a reasoned combination of iodine deficiency theory and infection theory. The latter is warmly

supported by Galli-Balerio, who is only an adherent of the iodine deficiency theory to the extent that iodine is able to neutralize the noxa causing goiter where the latter is not acting too intensively. Iodine is the antidote whose employment should not prevent an interest being taken in all the essentials of general hygiene.

The Congress almost unanimously refused the specific goitrous infection theory.

The aims of goiter prophylaxis as brought out in the discussion, may be shortly summarized as follows: for man and cattle to supply the necessary physiological ration of iodine; for the already marked school goiter to combat this by individual iodine treatment in medical hands; to ensure a normal composition of food-supply containing vitamins; and finally, to combat the misuse of iodine in unphysiological doses, especially in the adult. Should a more general application of these principles result, the conference will have done something not only for the scientific recognition of endemic goiter, but also for its abolition.

It is interesting to note that at an International Congress on endemic goiter held in Lyons, in 1841, Dr. Prevost of Geneva ascribed goiter to the absence of bromine or iodine in drinking water. Ten years later the French chemist, Chatin confirmed this theory in its essential points. The present discussion of goiter and its prevention, therefore, dates back at least as far as the Conference of 1841.

Bureau of Health, Richmond, Va.
—The 1926 report of the Bureau of Health forms a part of the annual statement of the Department of Public Welfare of Richmond. Two epidemics are noted, one of rabies in dogs, and the other of influenza and pneumonia, the latter being particularly severe among colored persons. Former records for typhoid fever were broken,

with less cases and deaths reported than usual, a death rate per 100,000 of 1.1 being recorded. An effective chart of the typhoid fever experience, 1880-1926, adds interest to the report. Efforts to eliminate dry closets and wells were continued and a reduction in the number of unsewered homes from 642 to 411, with a reduction in the number of wells from 159 to 108, was recorded.

On the basis of an estimated population of 189,084, a crude death rate of 16.05 is recorded; 23.8 for colored and 12.8 for white persons. The birth rate for white persons was 19.24; for colored persons, 25.68; for both combined, 21.13. In all, 21 per cent of the births were attended by midwives. An infant mortality rate of 107 is reported, the rate for colored infants especially being higher than recently. A declining birth rate, the influenza epidemic, an increase in deaths from infantile diarrhea, and increases in deaths from premature birth and congenital debility, are noted as important factors in the infant mortality rate.

The milk supply comes from 10,063 cows on 239 dairy farms in 28 counties within the state. All herds have been tuberculin tested and reacting animals removed. The average score of dairies at the end of the year was 81.0. This entire report has been carefully prepared and contains many interesting statistical tables with descriptive text.

Maternal Mortality—Dr. Samuel J. Crumbine made several pertinent statements on January 3 at Battle Creek while addressing the Third Race Betterment Conference on "Has Maternal Mortality any Significance in Race Deterioration?"

Based upon figures representing the

39 states included in the U. S. Death Registration Area in 1924, it was found that in 33 states, maternal deaths were second in importance only to tuberculosis as a cause of death among women 15 to 44 years of age. In one state, maternal deaths shared second place with heart disease. In 4 states, maternal deaths formed the leading cause of death of women 15 to 44 years of age.

Since the ultimate consequences of maternal deaths are measured in their effect on the lives of surviving children and since an average of two children survive each maternal death, the annual loss of women from maternal causes is doubled if its effect on the future of their children is considered. The maternal death is also a forerunner of a high infant mortality and, likewise, finds expression in its social effect by increasing child delinquency. Maternal deaths are a chief disrupting factor in family life, and the state, which depends for its solidarity on the preservation of the family, must recognize the care of mothers as its chief responsibility.

Diphtheria Prevention—The November issue of *Public Health News* published by the New Jersey State Department of Health discloses the fact that diphtheria was more prevalent in the State of New Jersey during the first 9 months of 1927 than it was during the corresponding period of the preceding year, there being 3748 cases reported for the 1927 period, and 2557 cases for the first 9 months of 1926.

This issue of *Public Health News* contains a very timely and complete description of active immunization against diphtheria, and detailed description of the organization and maintenance of diphtheria prevention clinics.

LABORATORY

C. C. YOUNG

MEDIA FOR MILK COUNTS

JOHN F. NORTON, Ph.D. FELLOW A. P. H. A.

University of Chicago, Chicago, Ill.

THE fifth edition of *Standard Methods of Milk Analysis* (1927) specifies a "standard beef extract agar" for use in the standard plate count for the number of bacteria in milk. These methods also approve the use of dehydrated media. It is fully recognized that the specifications for the beef extract agar medium are not so exacting that two laboratories will prepare exactly the same material from a standpoint of bacterial nutrition. Indeed, it is probable that different batches made in the same laboratory will not be entirely uniform in chemical composition. The particular brand of beef extract or peptone or agar used will determine this composition and the rather lenient pH range will also affect the number of colonies appearing on an agar plate under the specified standard conditions. It must also be remembered that no medium will give the true bacterial count. Nevertheless, it is believed that with careful technic the "standard beef extract agar" is a practical medium for use in laboratory control tests for milk supplies.

However, no standard procedure should be regarded as giving a final answer to any laboratory method. It is perfectly proper to question the validity of such a standard and to attempt to improve upon it. It is fairly safe to predict that changes will sometime be made in the present standard medium. It is also possible that an entirely different medium may be devised that will give better results. The ideal medium for

the counting of viable bacteria in milk is one which is simple and cheap to prepare; will contain ingredients of uniform and known chemical composition so that the composition of the medium at time of use will not be variable; will allow the ready growth and recognition of colonies of bacteria; and will give uniform colony counts. Some of these requirements are interrelated. I have not included a specification that an ideal medium will yield a maximum number of colonies. If uniform results are obtainable, a maximum count would seem to be of minor importance in a control laboratory. If bacterial standards are used they can be set on the basis of the medium employed just as such standards must be devised on the basis of the conditions in the community served.

Since 1915 a number of articles have appeared dealing with the problems above outlined. Berry¹ attempted to modify meat juice-peptone media so as to obtain more favorable growth conditions and at the same time lessen the cost. She found that with the standard medium recommended at that time, dilution of the medium up to about 1-8 actually increased the number of colonies appearing and that a dilution of 1-12 gave about the same count as the original medium. Sherman² showed that more and larger colonies could be obtained when lactose was added to the nutrient agar medium. Sears and Case³ maintained that the standard medium then in vogue was deficient in nutrient material

and advocated the use of sterile milk for dilution blanks to furnish supplementary food. Ayers and Mudge⁴ have suggested a milk powder medium on which are obtained relatively high counts, large colonies and some bacterial type differentiation. Supplee, Whiting and Downs⁵ made a rather extensive study of variations in milk counts as affected by the medium used and by the incubating temperatures. They advocated the use of dextrose agar at 37°C. Parker and Byers,⁶ Supplee and Ashbaugh,⁷ and Zoller⁸ have confirmed the claims of Ayers and Mudge for the milk powder medium. Frobisher⁹ has compared the results obtained with standard agar, lactose agar, milk powder agar, milk powder agar with yeast and milk powder agar with 1 per cent lactose. All of the enriched media gave higher total counts and larger colonies than the standard agar. He appeared to favor lactose agar as the most suitable medium. Norton and Seymour¹⁰ compared the counts on five different media—"standard" meat extract agar, meat infusion agar, dehydrated meat extract agar, dehydrated peptonized milk agar, and Ayers' milk powder agar. They obtained somewhat higher colony counts on the two latter media than on "standard" or meat infusion agar. The dehydrated nutrient agar was intermediate. However, the coefficients of variation indicated that somewhat

more uniform counts were obtained with the "standard" and meat infusion media which in the authors' opinion served to offset the more easily counted plates obtained with media containing milk.

The ideal medium for obtaining the bacterial count of samples of raw or pasteurized milk has not been devised. Valid criticisms have been made of every medium so far suggested. It seems to the writer that we know too little of the fundamental chemical properties of our media. We must study these more intensively than has yet been done. Peptone is a common ingredient of our media. How can we expect to obtain uniform results from a variety of peptones? This situation has been recognized and is being attacked. But if this difficulty is solved still others remain. A more accurate knowledge of the fundamentals of bacterial nutrition is the only final solution.

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A SATISFACTORY METHOD OF STAINING BLOOD SLIDES FOR MALARIA

WM. KRAUSS, M.D.,
Memphis, Tenn.

THE slides coming into public health laboratories for examination for malaria parasites are usually rather unsatisfactory and often quite unfit for examination by the ordinary Wright method.

I have encouraged my doctors to make rather thick smears, spreading the blood

with one slide upon the other, "like butter upon bread." Such smears are just distinctly red and correspond to the thicker portion of very bad smears.

The slides are fixed in methyl alcohol containing 1 per cent official hydrochloric acid for 3 to 5 minutes. They are

then rinsed under the tap and further washed in a staining dish in running water for 10 minutes.

They are then stained by immersion in a Coplin jar as follows:

- (a) 1 c.c. Wright stain
2 c.c. Methyl alcohol
Distilled water sufficient to make 50 c.c.

Mix the stain and alcohol and pour into the water. Leave in the stain for 15 minutes and rinse in tap water.

- (b) Giemsa Method:
1.5 to 2 c.c. Giemsa stain
50 c.c. Distilled water

Pour the Giemsa into the water. Stain the slides for 30 minutes.

- (c) Have on hand:
1. 1% aqueous solution Eosin W.g.
2. 1% aqueous solution Azur No. 11 (Gruebler)

To 50 c.c. distilled water add 1 c.c. solution No. 1. Stir well, then add 2 c.c. solution No. 2; stir and pour into the Coplin jar containing the slides. Stain for 15 minutes.

These three formulae permit a choice of the stain to which one is accustomed. The advantage of the last named one is that the stain never "goes bad."

One batch of slides will exhaust either of these staining solutions.

Single slides may be stained face down in a Petri dish, supported on a match, in a quantity of stain sufficient for the purpose.

With some practice one can examine these acid-fixed slides in half the time required for the ordinary method. The proportion of positive finds will be materially higher.

The acid fixation is not so desirable for the regulation thick film of Ross as the original Ross Method modified by Schilling and Barber. However, the film is less likely to peel off. The objection is that the background of coagulated albumin prevents a clear view of the parasites. This objection does not apply to the thinner or intermediate smears.

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

Longevity of the Presidents— Although the number of lives studied is entirely too small for positive statistical analysis there seems to be sufficient evidence to conclude that the duties of the presidency have shortened the lives of the presidents since the Civil War. The average age at inauguration of the 29 presidents was 54.31 years, Theodore Roosevelt at 42 being the youngest and William Henry Harrison at 68 the oldest. The average age at death of the 27 presidents who have died is 68.41 years and our one living ex-president, Chief Justice Taft is now 70. The average age at death of the 15 presidents of the pre-Civil War era, from Washington

to Buchanan was 73.8 years whereas that of the 12 deceased presidents of the post-Civil-War period was only 61.7 years.

According to life tables the combined expectation of life of the 15 presidents of the pre-Civil-War period at accession was 229.65 years. They actually lived 250.02 or 20.37 years in excess of the expected. The combined expectation of life on assumption of office of the 12 deceased presidents from Lincoln to Harding was 228.81 years but they lived only 123.12 years or 105.69 years less than their normal expectancy. If the life expectancy of Coolidge and Taft should be fulfilled, the years actually lived by the post-Civil-War presidents would be

164.08 or still 105.69 years below the expected and the average life tenure of the 14 since they assumed office would be 7.55 years below the expected as compared with 1.35 years above the expected for the 15 presidents prior to the Civil War. Of the 15 pre-Civil-War presidents, 9 exceeded their life expectations at accession, but of the 12 deceased presidents since 1861 only Grover Cleveland lived beyond his normal expectancy by 1.3 years. Even if the 3 presidents, Lincoln, Garfield and McKinley, who were assassinated since 1861 had lived out their life expectations the post-Civil-War presidents would still fall far short of living as long as expected at the ages at which they were inaugurated.—*Stat. Bull. Met. Life Ins. Co.* 8:2 (Dec.), 1927.

The Principal Causes of Death in 1926—The Department of Commerce reports a slight increase in the 1926 death rate for the death registration area of the United States, which comprises 89.8 per cent of the estimated population of the country. The death rate in 1926 was 12.2 per 1,000 population as against 11.8 in 1925.

Heart disease continued to increase and the death rate rose from 185.5 in 1925 to 199.1 in 1926. Pneumonia and influenza recorded large increases from 93.5 in 1925 to 102.5 in 1926 and 29.6 in 1925 to 40.7 in 1926 respectively. The death rates in 1925 from nephritis (96.3), cancer (92.6) and tuberculosis (86.6) rose in 1926 to 98.3, 94.9, and 87.1 respectively. Diabetes increased from 16.9 in 1925 to 18.0 in 1926, measles from 2.3 in 1925 to 8.2 in 1926 and whooping cough from 6.7 to 8.9. Deaths from accidental causes increased slightly, from 78.3 to 78.6, while deaths from automobile accidents rose from 17.0 to 17.9 and suicides from 12.1 to 12.8.

The principal decreases in rates were from diarrhea and enteritis under 2 years

which fell from 31.5 to 27.0 and typhoid and paratyphoid fever from 8.0 to 6.5 per 100,000 population.—*Department of Commerce Preliminary Report*. Dec. 30, 1927.

Diphtheria and Scarlet Fever in Rio de Janeiro—A study of 520 Brazilian children and adolescents showed only 0.8 per cent with a past history of diphtheria and 0.6 with a history of scarlet fever. In North American surveys these percentages varied from 7.5 to 15 for diphtheria and from 8 to 27 for scarlet fever. The large number of negative Schick and Dick tests in Rio de Janeiro, however, indicates that sub-clinical infection with diphtheria bacillus and *Streptococcus scarlatinae* must be more common there than in cities of the United States, where the case rate from these diseases is much higher. A clinical case of either of these diseases in that city, therefore, might be regarded as an accident in the immunization process due to particular susceptibility of the individual, an unusually massive infection or temporarily increased pathogenicity of the microorganism.

Brazilian children seem to develop immunity especially to the streptococcus toxin at an earlier age and to a greater extent than do children in New York City. The very high percentage of negative Dick tests among children, particularly in orphanages, strongly suggests an exceptional racial capacity to develop immunity to scarlet fever. This theory is strengthened by the fact that there has not been any appreciable mortality from scarlet fever since 1880.—James A. Doull, Manoel J. Ferreira and Decio Parreiras. *J. Prev. Med.* 1:513-527 (Nov.), 1927.

Common Infectious Diseases in Brazil—The results of this study confirm the observations from other studies that scarlet fever is rare and diphtheria quite infrequent in the tropics. Only 3

of 519 persons between 8 and 20 years of age stated that they had ever had scarlet fever, and 4 of 521 had diphtheria. Of 266 over 20 years, 6 had had diphtheria and 4 of 319 had scarlet fever. All of these having a history of scarlet fever came from the southern and less tropical sections of Brazil. The diphtheria mortality rate in 1920 and 1921 in Rio de Janeiro was 5.3 and in the same two years there were only 6 deaths from scarlet fever. In Sao Paulo, 50 miles south of Rio de Janeiro, and having a cooler climate, the death rate in 1920 was 12.2 for diphtheria and 10.6 for scarlet fever. In 1918 the scarlet fever death rate rose from 5 to 23 but dropped to 0.5 by 1923.

Measles, mumps, whooping cough, and chicken pox, however, seem to be about as common in Brazil as in North America. The mortality from measles in Rio de Janeiro, 1917-1923, averaged 25.5 per 100,000 population, rising to 51.9 in 1925. The whooping cough mortality in Rio de Janeiro in 1917 to 1923 was 22.1. Sao Paulo in the same period had rates averaging 8.3 for whooping cough and 13.7 for measles.—James A. Doull, Manoel J. Ferreira and Decio Parreiras. *J. Prev. Med.* 1:503-512 (Nov.), 1927.

Infantile Paralysis in Haverhill—The infantile paralysis epidemic in Haverhill, Mass., with a case rate of 2.2 per 1,000 population exceeded the previous maximum incidence rate of 1.8 in New York in 1916 and of 1925 in New Zealand and Iceland. At the waning of the epidemic in the last of October, 105 cases with 15 deaths had been reported. About 1 out of every 70 of the 4,000 children of preschool age had the disease and 7 deaths occurred in this group. There were 45 cases and 8 deaths among the 12,000 children of school age. The state report shows that up to the last of October, 908 cases had occurred, so that Haverhill has had about 10 per cent of

the total cases reported for the entire state.

The records of the Board of Health show that in the 17 previous years there have been 172 cases and 29 deaths from the disease in Haverhill. One hundred and thirty-three of these cases occurred in cycle years of 1913-1914, 1916-1917 and 1920-1921. Since 1910, 42 or about 25 per cent of the cases occurred among children in Ward 5, in 1917 this percentage increased to 70 while 60 of the 104 cases of the present year occurred in the same ward. Thirty-nine of the 60 patients in Ward 5 were of French ancestry, and 12 of the 15 deaths in the city occurred in this ward, all of them being of French-Canadian descent, and still another death was also in a family of French ancestry.

The average age of the children with the disease was 5 years and 8 months, approximately the same as the average age of previous epidemics. The deaths by ages were: one 10 months, one 2 years, three 4 years, two 5 years, two 7 years, four 8 years and two 16 years. The illness of these 15 cases before death varied from 3 to 12 days.

There were 25 cases in Ipswich, a town of about 6,050 population 14 miles from Haverhill. This incidence rate of 4 per 1,000 is the highest ever known.—George T. Lennon. *Boston M. & S. J.* 197:916-920 (Nov. 17), 1927.

Public Health in Madras—The population of Madras is about 40 millions and is steadily increasing despite the fact that the death rate in 1926 was 24 and the infant mortality 189 per 1,000. There were 24,407 deaths from cholera, 10,457 from smallpox, 2,143 from plague, 91,758 from dysentery and diarrhea, and 337,945 from fevers. Only about 55 mothers per 1,000 receive skilled attention during labor, and this partly accounts for the large number of deaths, 7,142, from diseases connected with childbirth.—*Pub. Health* 41:37-38. (Nov.), 1927.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

RECENT PROGRESS IN REFUSE COLLECTION AND DISPOSAL*

THERE has been comparatively little noteworthy development in the field of garbage and refuse collection and disposal during the past year. Such projects as are of general interest are briefly summarized herewith.

Birmingham, Ala.—In November, 1926, Birmingham awarded a contract for three incinerators with capacities of 60, 90 and 180 tons per 24 hours. The contract entered into amounted to \$352,800. The plants are being built by C. O. Bartlett and Snow Company and are of the top charged, outside storage, high temperature type, with forced draft.

Los Angeles, Calif.—The construction of an incinerator of 800 tons per 24 hours capacity at a cost of \$370,000 was completed in 1927 for the city of Los Angeles by the Nye Odorless Incinerator Company. The furnaces are of the beehive type connected to a common flue. The capacity is guaranteed when burning 65 per cent by weight of garbage and 35 per cent by weight of rubbish. It is understood that the garbage consists chiefly of market refuse.

* Report of the Committee, presented to the Public Health Engineering Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 19, 1927.

Buffalo, N. Y.—A refuse incinerator having a capacity of 500 tons per 24 hours has been almost finished for the City of Buffalo by the Hiler Engineering Company of New York. The furnaces are of the outside storage, top charged, high temperature type.

Indianapolis, Ind.—The garbage reduction plant at Indianapolis has been put into operation during the last month or two. This plant comprises apparatus for reducing the garbage to grease, stock food, tankage, etc. A noteworthy feature is the production of stock food which appears to have a first rate market for feeding hogs and chickens.

A plant of different type but producing also a stock food has been operating during the year at Kansas City.

In closing, it is suggested that those interested should read an article published in *Industrial and Engineering Chemistry* for May, 1927 by Harrison E. Howe of Washington, D. C., entitled, "Progress in Garbage Reduction."

SAMUEL A. GREELEY, *Chairman*
M. N. BAKER
C. A. HOLMQUIST
JOHN H. GREGORY
• E. D. RICH

Sewage Disposal in 1927—This is a discussion of sewage disposal, with special reference to English practice. Land irrigation is probably the soundest method of purification where soil and sub-soil conditions are suitable, and the volume of sewage to be treated is well within the purifying capacity of the area

available—1 acre per 100 contributing population. Contact beds are not considered a sound economical method of freeing sewage from its tendency to putrefy. Percolating filters are popular and deservedly so. The initial cost is higher than for an activated sludge plant but maintenance and operating

costs are lower. Compared with an activated sludge plant a percolating filter installation may be called "foolproof," and its bacterial population is wonderfully adaptable to varying conditions, including change of temperature and character of sewage to be treated. The activated sludge process is not so popular as it was, probably as a result of "the untoward zeal of some of its advocates and their belated consciousness of its limitations." It has been proved to be scientifically sound and its suitability for certain kinds of work is unchallenged; but it is not suitable for the treatment of all kinds of sewage, nor is it economically adaptable to all situations. Its successful application requires more knowledge and skilful management and it is not, generally speaking, so reliable under all circumstances as the older and better tried methods. Lagooning is the most popular method of sludge disposal. The Imhoff tank has not found favor in England.—J. D. Watson. *Surveyor*, 72:5 (July 1), 1927. Abstr. R. E. Thompson.

Practical Swimming Pool Sanitation Control—Detroit's 37 pools represent all types, from old fill and draw to modernly equipped pools with recirculating pumps, hair strainers, sand filters and sterilization. Only two are outdoor pools.

Inspections are made every 2nd and 3rd day and water samples taken. Bacterial standards are: (1) A median monthly total count of not over 2000 per c.c.; (2) not over 50 per cent of samples in any month shall show presence of *B. coli*; (3) not over 20 per cent of samples in a given month shall show a colon count of over 10 per 100 c.c.

The publication of the standing of the pools has been an incentive to meet the requirements.

It does not require modern equipment to stand well upon the list as to sanitation. The personnel has much to do with results obtained. Good coöperation is

obtained from those in charge of the swimming pools.—W. H. Cary, Jr. *Nation's Health*, 9:16 (May 15), 1927. Abstr. L. M. Fisher.

Some Recent Experiments in Fly Control—The experience of the U. S. Bureau of Dairying in controlling flies on an experimental farm at Beltsville, Md., during the year 1924 and 1925, is given in detail. House flies which prefer horse manure as a breeding place but breed readily in cow manure, and stable flies which prefer damp straw or hay on which to lay eggs but will readily lay eggs upon straw mixed with manure, had always been numerous.

In order to control breeding, all manure was hauled away at least once each week and box stalls in which considerable straw was used, were cleaned and the floors scraped regularly. The manure was either spread on fields or placed in large piles one-half mile from the buildings. Failure to remove manure on time resulted in a marked increase in flies. The author holds that the elimination of breeding places is the greatest factor in fly control.

Fly traps were also used in this work due to inability to eliminate all breeding places on the property and to the presence of breeding places on neighboring farms. In discussion it was brought out that experiments in liberating marked flies by the U. S. Department of Agriculture at Dallas, Tex., showed that the house fly traveled 11 miles in 4 to 7 days, and some were caught as much as 17 miles from the point of liberation. The length of flight indicates the necessity for using traps in addition to controlling local breeding places. Ten cylindrical fly traps similar to those described in the U. S. Department of Agriculture *Farmer's Bulletin No. 734* were used in scattered positions. They were baited with blackstrap molasses from sugar cane, diluted with 3 or 4 parts of water which, when it fermented, drew

flies in large numbers. Bait was replenished about once a week. The effect of the traps could be noticed after about 10 days use during August when flies were numerous. During 1925 the 10 traps caught 86 gallons of flies estimated by making counts to run 50,000 or 60,000 flies to the gallon.

As an added protection against flies entering the milk room, a 30-inch electric fan was attached to the porch ceiling causing a slight air current against the screen door which proved very effective in keeping flies off the screen door and porch.

To protect cattle from horn and stable flies, a spray made by soaking one pound of partially opened dried pyrethrum flowers (purchased in 20 lb. lots) in two gallons of kerosene oil for 48 hours was used. This is a killing spray rather than a repellent. It cost from 35 to 40 cents per gallon. It was applied by air pressure sprayer using a nozzle capable of producing a very fine vapor. Horn flies were quickly killed if caught in a cloud of vapor as they swarmed after the first spray struck them. While horn flies lay their eggs in fresh droppings their number was appreciably reduced after a week of daily spraying. Stable flies were killed by spraying them as they were found sucking blood on the cows' legs. Stable flies were much harder to control, however.

Care should be exercised not to wet the cattle unnecessarily with the spray as the kerosene is irritating. When this spray was used one hour before milking no difficulties were experienced in causing odors or tastes in the milk.

Results of this fly control work are reported as satisfactory. No statement is given as to the total cost of control. There was considerable discussion of this paper.—R. J. Posson. *Proceedings of the 19-20th Conference of Amer. Assn. of Medical Milk Commissions and Certified Milk Producers Assn. of America*. pp. 322-327. Abstr. W. D. Tiedeman.

Distribution of Cellulose in Imhoff Tanks—This is a preliminary report on the cellulose content and distribution in fresh sewage solids of an Imhoff tank at Plainfield, N. J. The solids were collected by suspending pails for 24 hours in the flowing through compartment at the inlet, middle portion and outlet. Samples from each point and from the mixture of the three portions were analyzed. A table is given showing results of solids concentration, volatile matter and cellulose content. A selective settling is indicated and, in view of the relation of cellulose to CO₂ production, the efficiency of the tank would be greatly affected by the design and the opportunity for reversal of flow.—H. Heukelekian. *Pub. Works*, 58:133 (Apr.), 1927. Abstr. A. S. Bedell.

Great Advances in Water Softening—This article contains an excellent summary of modern ideas and present methods of water softening. It emphasizes advantages and disadvantages and describes such equipment as pneumatic conveyors for the handling of chemicals, continuous lime slaking machines, mechanical agitators for chemical mixing, sludge removal equipment and recarbonization plants. Tentative estimates are also given to compare the cost of zeolite and soda-ash treatment as applied to the Columbus filtration plant. Natural gas and kerosene oil are recommended as the most suitable fuels to be used for the generation of carbon dioxide gas. For large installations producer gas made from coke and then burned to complete combustion is the most economical method. The paper contains the description of such a plant now under construction at Columbus, O. The effects of recarbonization and of the addition of sodium aluminate upon the corrosive properties of a water are also discussed.—Charles P. Hoover. *Water Works Eng.*, 80:991 1019 (July 6), 1927. Abstr. W. L. Havens.

Résumé of Progress in Chlorination—The early history of chlorination is reviewed briefly, and recent developments are discussed in some detail, with special reference to Toronto, Ont. The employment of prechlorination is extending. In Toronto, the cost of operation of the drifting sand plant has been reduced by \$150,000 over a period of 4 years by applying chlorine to the raw water instead of alum at such times as the water is physically good. With moderately turbid water, considerable economy can be effected by applying small doses of chlorine and reducing the alum to just sufficient for clarification. The observation that chlorination aids coagulation has been confirmed at Toronto. Other advantages of prechlorination are reduction of filter load in heavily polluted water and increased rates of filtration; and it constitutes an additional safeguard in the treatment of water subject to rapid changes in quality. Chlorine is being increasingly employed for destruction and prevention of algal growths in filter underdrains and sedimentation basins. Applications of excess chlorine and, subsequently, copper sulfate, were ineffective for reducing the loss of head which rapidly increases in slow sand filters at Toronto during a 2-months period each spring. The recently inaugurated super-and de-chlorination treatment for prevention of taste at Toronto is outlined and discussed.—Norman J. Howard. *Canad. Eng.*, 52:116 (Mar. 8), 1927. Abstr. R. E. Thompson.

A Study of Refuse Collection and Disposal in Sydney, Australia—The article is an abstract of Mr. Newman's comprehensive report on the subject. The refuse burnt in the destructors in Sydney is of three types, household refuse, early morning refuse and trade refuse. Household refuse represents 60 per cent of the total and consists of garbage, dirt, ashes, tins and paper, weighing 750-800 lbs. per cu. yd. "Early

morning refuse" is coined to describe the refuse collected between 6:30 and 8:30 a. m., intermediate in composition between household and trade refuse, consisting of shop, office, cafe and hotel refuse, averaging 36 per cent paper and weighing 500 lbs. per cu. yd. Refuse from municipal fish, fruit and vegetable markets is converted by a private company into fertilizer.

Owing to mixed collection, the results of analyses of Sydney refuse differ from those prevailing in America, being 44.7 per cent water, 29.7 per cent combustible, and 25.6 per cent ash, and having a calorific value of 3,007 B. T. U. The recommended method of disposal is separation-incineration, and the specifications for a new destructor should provide that it burn, without additional fuel, mixed refuse containing not over 900 lbs. of water per ton and not less than 800 lbs. of combustibles.—R. K. Newman. *Am. City*, 37:61 (July), 1927. Abstr. A. S. Bedell.

Abbreviated Report of the Government (Holland) Water Supply Bureau for 1925—A short account is given of the rural supply projects inaugurated and in course of inauguration under the bureau's auspices, outlining the many and various difficulties with which such undertakings have to contend. The manifold functions of the bureau include, for example, technical advice on such matters as deferrization and demanization. The government is keenly alive to the desirability of providing reliable water for the rural population as well as for the urban. In more prosperous times it even participated financially in certain approved projects and even now is prepared to assume in some cases a certain contingent liability. Upon the bureau rests the responsibility of seeing that these rural supply projects are established upon the soundest possible basis, both technically and financially. Activities to this end are summarized un-

der 93 headings. Perhaps the greatest difficulty to be surmounted is that of popularizing the idea of paying for water among the thrifty and independent Dutch. Some of the propaganda work is described. In an appendix, Engineer Markus of the bureau lists for 94 Dutch waters the hardness as deduced by the application of certain formulae from the electrical conductivity and the hardness as found by analysis. Agreement is moderately satisfactory.—*Verslagen En Mededeelingen Betreffende De Volksgezondheid*, 7:649 (July), 1926. Abstr. Frank Hannan.

Sewage Plant Records—This is a discussion of the purpose of the plant records and explanations of kinds of data worthy of recording. Purpose fourfold to show: plant efficiency plant effectiveness, line of defense against unjust criticism, adequate information for plant improvement. Data needed include: number and kind of connections, continuous meter records of flow at outfalls, oxygen demand by methylene blue test, suspended solids, and pH determinations at various points of treatments. Determination of ammonias yields little information of value. Illustration is given of value of records in showing need of plant enlargement where metering had cut down per capita water consumption 20 per cent and population had increased 40 per cent. A method is given in detail for converting from plant data giving "suspended solids retained" to amount of sludge to be moved.—John R. Downes. *Water Works* 66:335 (Aug.), 1927. Abstr. W. R. Schreiner.

Some Problems of Seaside Health Resorts—The author discusses in a somewhat pessimistic but none the less candid manner the numerous problems confronting the governing authorities of a seaside resort.

Sewage and refuse disposal, particularly present difficulties not encountered at

inland or all-year-round communities. In order to be successful in so far as attraction and popularity are concerned, the psychological aspect of the summer visitor must be considered. In the matter of the sewer line extension and outfall, and the avoidance of any hint of even storm water deposits near the beaches, as well as too frequent refuse collection in order to cater to the esthetic rather than the practical, considerable unnecessary expense is involved.

The widely varying conditions of the summer season and the "off-season" cause problems of housing and unemployment seldom encountered elsewhere.

Other features discussed, but not directly concerning the public health, are local attractions, development of sea front, the economics of bathing pool operation and bathing privileges, tennis courts and golf courses, storm shelters and comfort stations and finally the highway and motor car problem.—Leslie Roseveare. *Surveyor* 71:625 (June 24), 1927. Abstr. H. N. Old.

Camels and Plague—The method of transmission of plague from the Orient along caravan routes to Europe has long been unexplained. In connection with a study of 4 plague cases in Astrakhan, obviously caused by ingesting salt meat from a dead camel, the camel was suspected as being part of the chain of transmission.

Plague cultures inoculated into 4 camels produced typical plague. It was also produced by feeding the animals green plants dipped in plague cultures. Infected camels might easily contaminate the fodder to be eaten by others and in that way spread the line of infected animals over long distances. At the European end of the line, and since the ingestion of the flesh of dead animals may produce disease, the way rodents might be infected can readily be seen. *Centralbl. f. Bakteriöl.*, 98:24, 1926; *Nation's Health* 9:58 (Apr. 15), 1927.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M.D. AND LEONARD GREENBURG, PH.D.

Experimental Studies On the Effect of Ethyl Gasoline and Its Combustion Products—This bulletin of 447 pages including 105 pages of appendix is replete with tables, graphs, and illustrations to complete the text of the extensive studies made at the Pittsburgh Experiment Station of the U. S. Bureau of Mines extending from December 6, 1923, to August, 1925. Part I concerns the physiological effect of exhaust gases from engines using ethyl gasoline. Part II, the effects of inhalation of unburned vapors from ethyl gasoline and other motor fuels (gasoline-benzol mixtures, straight benzol vapors and various combinations of ethyl gasoline with these). Part III, deals with skin absorption experiments with ethyl gasoline, 50-50 benzol-gasoline blend, benzol, and benzene (c.p.). In this part are also considered inhalation experiments with animals treated with ethyl gasoline and with other mixtures and chemicals above stated. The following are abstracted from the general summary and findings of investigations which appear on pages 14-28:

Part I. Physiological Effects of Exhaust Gases from Engines Using Ethyl Gasoline

Campaign 1. Tests Conducted with Gasoline Containing the Commercial Amount of Ethyl Fluid

1. Duration of exposure—December 6, 1923, to July 26, 1924.

7. Storage of lead by animals—No distinct storage of lead was found in the animals exposed during Campaign 1. With only two exceptions the results of analysis were similar to those obtained from control animals. The exceptions were a 6-hour exposure rab-

bit and a 6-hour exposure guinea pig in which the lead found was 0.190 and 0.094 mg. per 100 g. of body weight, respectively.

8. Pathology—No distinct pathological lesions attributable to lead poisoning were found.

9. Hematology—No anemia, change in red- or white-cell counts was noted, nor was there any increase in polychromatophilia or punctate basophilic, other than that found in control animals of like species.

10. Symptoms—From the observations made it appears that the exposure to lead during Campaign 1 was not productive of the characteristic symptoms of lead poisoning. The only symptoms exhibited were those of intercurrent disease and were impartially distributed among control, 3-hour, and 6-hour exposure groups, and without dependence on the total period of exposure. With the above exception the animals were healthy, lively, and had good appetites.

12. Manifestation of effects—The effects of exposure to the concentrations of lead prevailing in the air during this campaign were not manifested by the storage of lead, pathology, hematology, symptoms, weight and growth of the animals exposed.

Campaign 2—Tests Conducted with Gasoline Containing Five Times the Commercial Concentration of Lead Tetraethyl

20. Concentration—It appears that the conditions under which the animals were exposed is close to the threshold concentration for monkeys, dogs, rabbits, and guinea pigs. Some animals of each group showed little or

no storage, while others showed distinct storage though not a comparatively large amount.

27. Tests on men—Tests conducted on men breathing exhaust gases from ethyl gasoline show that on the average, 87 per cent of the inhaled lead dust was again exhaled, leaving only approximately 13 per cent as retained in the lungs and respiratory passages.

Part II.—Effects of Inhaled Ethyl Gasoline Vapor

5. Effect of gasoline on animals—(a) Storage of lead—A number of the animals were examined for storage of lead, and the amounts found were similar to those for unexposed control animals.

(b) Pathology—The general findings in all concentrations were hyperemia of the lungs, granular degeneration of the liver, and granular degeneration of the kidneys which sometimes lead to pitting and scarring, especially in rabbits. . . .

(c) Hematology—The blood changes were minor and of little significance.

(d) Symptoms—The symptoms were unsteadiness, drowsiness, and moderate watering of nose and eyes due to irritation. These symptoms were not noticeable in the lowest concentration (0.10 per cent vapor) and were marked in the 10 per cent concentration. They disappeared shortly after each exposure.

6. Effects of Ethyl Gasoline and gasoline containing higher concentrations of lead tetraethyl and ethylene dibromide—(a) Storage of lead—Some of the animals exposed to 0.10 per cent ethyl gasoline vapor showed distinct storage of lead. Nearly all guinea pigs exposed to higher concentrations showed storage. Nearly all the monkeys, dogs and rabbits which were exposed to 0.3 per cent ethyl gasoline vapor showed storage of lead.

7. Effects of a mixture of equal parts gasoline and motor benzol—(a) Path-

ology—The general findings were acute degeneration of the liver and kidneys, anemia of the spleen, congested adrenals and hyperemia of the lungs. An edema of the lungs was found in animals that died after exposure to 1.0 per cent vapors. These findings are similar to those for gasoline alone.

(b) Hematology—No effect on the number of white cells or hemoglobin content was noted. The red cells showed a tendency toward polycythemia.

8. Effect of motor benzol on guinea pigs—(a) Pathology—The general findings were degeneration of liver and kidneys, anemic spleen, congested pancreas and adrenals, congestion of lungs and an edema in animals dying from exposure to 0.3 and 1.0 per cent vapors. These observations are similar to those for gasoline vapor.

(b) Hematology—No leukopenia or anemia were observed. There was a slight increase in the red cells, also a moderate polychromatophilia.

Part III.—Effects of Ethyl Gasoline When Absorbed Through the Skin

1. Materials used—(a) Water; (b) gasoline; (c) ethyl gasoline (1:1300); (d) gasoline containing 10 times the commercial concentration of lead tetraethyl (1:127) and ethylene dibromide; (e) benzol-gasoline blend; (f) motor benzol; and (g) benzene (c.p.) (C_6H_6).

5. Relative effects of absorption—Greater injurious effects were produced on animals when the material applied could gain entrance to the body through the skin, gastrointestinal and respiratory system than by the skin and gastrointestinal tract or through the skin.

When the material applied could gain entrance to the body through skin and gastrointestinal tract, it was slightly more injurious than when limited to skin absorption.

When the material was applied on rats, guinea pigs, and rabbits so that it could be absorbed through the skin, inhaled and ingested, and if the animals were intimately associated the general effect was more or less independent of the size of the dose administered.

10. Animals treated with benzol—(a) Benzol applied in doses of 0.5 c.c. so that it could be absorbed through the skin, inhaled, and ingested, eventually was found to be fatal for rats and 1.0 c.c. for guinea pigs, but rabbits appeared to be able to withstand doses of 1.0 c.c. if they were not complicated by infections. Guinea pigs that received doses of 1.0 c.c. of benzol in such a manner so that it could only be absorbed through the skin apparently were not injured in health.

(b) The general pathological changes found in the animals treated with benzol were an acute parenchymatous degeneration of the liver and kidneys.

(c) The blood picture was that of a slight anemia, which was manifested by an attempt of an increased production of erythrocytes.

(d) The symptoms of the animals treated with benzol were a local skin irritation which healed and became inflamed periodically. The treatments became more irritating as the tests progressed, and produced convulsions in the guinea pigs that received 1.0 c.c. when they had been on test for some time.

(e) All of the animals treated with benzol lost weight during the first few weeks, but this was regained by those that survived this period.—Sayers, Fieldner, Yant and Thomas, *Report of the U. S. Bur. of Mines*, 1927, Washington, D. C.

Health Aspects of the Wood Working Industries—The following paragraphs are abstracted from the summary of this report:

2. In order to determine the prevalence of nasal irritation, asthma, and dermatitis in this group of workers, clinical examinations have been made of 208 persons employed in thirteen Melbourne joinery and furniture factories, and ten other wood-working employes have also been examined in respect to their dermatological condition.

3. It was found that 78 employes, or 37 per cent, of all factory examinees, presented departures from normal as regards their nasal condition. Of these 27, or 13 per cent, had abnormalities of the nose and throat, which were antecedent to occupation in the wood-working industry. . . . It has also been shown that employes in the age group under 21 were least affected, and that no person engaged less than two years in the wood industry evidenced nasal trouble. . . .

Wood machinists were found to show the greatest percentage affected in all the occupational groups, no fewer than 40 per cent having nasal trouble due to dust inhalation. . . .

4. In 113 persons, an aural examination was made, and abnormalities were recorded in 38, or 34 per cent, of the examinees. . . .

7. Only 1 person, of the 208 examinees, or 0.5 per cent, was found to be suffering from a dermatitis definitely due to a wood-working occupation. In this case, blackwood was the responsible agent. From other sources, 10 further cases were found, one of urticaria, probably occupational, and 9 of dermatitis. . . .

Recommendations—

1. In view of the large percentage of wood-workers found affected with nasal trouble definitely due to the inhalation of wood dust, it is strongly urged that these workers be adequately protected by the installation of an effective exhaust on each wood-working machine, so that the quantity of

wood dust liberated into the air of the workroom be minimized as far as possible.

2. Susceptible persons suffering from a dermatitis due to working with blackwood or other timbers cannot reasonably expect to be cured without cessation of this work, and removal from exposure to the cause of their dermatitis. It is recommended that this question be taken into serious consideration with the object of providing in some effective way for the small number of persons with this peculiar susceptibility.—D. G. Robertson, *Health*, Commonwealth of Australia, V, 5:150-151 (Sept.), 1927.

Health Survey of the Printing Trades, 1922 to 1925—The present survey concerns itself with approximately 300,000 workers engaged in the printing trades during the years 1922-1925. The information was obtained by means of a questionnaire sent to printing plants throughout the United States and Canada. The number of replies received was 2,000, representing 47 states, District of Columbia and certain portions of Canada. The survey revealed the fact that general conditions were found decidedly more satisfactory than had been anticipated. The sickness rate was apparently rather low. Sanitary conditions, evaluated by means of inspections, were found to be for the most part fairly satisfactory with the exception of an insufficiency of floor space and air space in many establishments. These deficiencies were found to be chiefly inherent in old printing plants. The study also revealed the very interesting fact that tuberculosis is no longer a menace of serious proportions in the printing industry, and lead poisoning likewise was found to be much lower than had been anticipated. The physical and medical examination of printing employes revealed the fact that the men were of good normal physique, their measure-

ments corresponding with those of the soldiers discharged at the close of the World War. There appeared to be a rather high incidence of visual defects, and according to Dr. Hoffman these are the result of ill adjusted posture. He says, "printers who are above the average in stature, unless properly provided with suitable seating facilities, may develop spinal curvature, which is fairly common and closely correlated to eye strain and other visual defects."

Dr. Hoffman concludes, "the problem of lead poisoning in the printing industry while always a grave and potential danger is now, at least in fatal form, of minor importance." For the year 1925 the U. S. Bureau of the Census reports only 5 deaths from chronic lead poisoning among some 300,000 printers. He further analyses the question of tuberculosis, and concludes that the decline in tuberculosis among printers employed in printing trades conforms to the observed decline in the population at large. And lastly, he points out that there exists a higher proportion of deaths from cancer among printers at the present time than existed in the past, the proportion of deaths being 4.2 per cent during the years 1912-1918 and 8.2 per cent during the years 1919-1923.

For all of those persons who are interested in the problem of industrial lead poisoning this study provides a large body of very valuable material.—Frederick L. Hoffman, *Bull. No. 427*, U. S. Bureau of Labor Statistics, Washington, Mar., 1927. L. G.

Annual Report of the Surgeon General of the Public Health Service of the United States for the Fiscal Year 1927—The activities of the Office of Industrial Hygiene and Sanitation of the U. S. Public Health Service for the year 1927 are described in some detail in the present report of the Surgeon General. This office, under the direction of Surgeon L. R. Thompson, has conducted

investigations of tetraethyl lead, occupational health hazards, occupational diseases and industrial absenteeism. Cooperation with certain other government departments and with industrial and other agencies has been carried on by this office also. The most noteworthy of the contributions of the Public Health Service along these lines have been the studies on tetraethyl lead which were continued during the past year. Air samples were obtained in the streets of 14 large cities of the United States as well as in certain garages and other industrial establishments. In addition to these, samples of dust were obtained in a similar group of establishments.

The valuable dust studies of the Service have been continued and 4 of the 7 studies have been completed; namely, the cement, granite, hard coal mining, and polishing and buffing of silverware. During the past year the reports on the cement and granite studies have received their final touches and are now in press. These dust studies will undoubtedly prove to be the most detailed and valuable ones made in the United States. It would appear that every aspect of the problem of dust inhalation has received careful and detailed consideration in these studies.

The Office of Industrial Hygiene of the U. S. Public Health Service has been interested in the problem of illumination for some time, and during the past year, in order to study the problem of distribution to daylight within factories and schoolrooms, an experimental illumination cabinet in the form of a building 30 feet square and about 16 feet high has been constructed in Arlington County, Va. Window space, ceiling height and

floor area may be altered at will, and it is proposed by means of illumination readings continued throughout the year to obtain fundamental data on the distribution of natural illumination in buildings.

The Service is becoming more interested in the problem of smoke pollution of the atmosphere and the loss of light due to smoke, and in order to study this latter problem daylight illumination recorders were installed, one on the lower end of Manhattan Island where the air is heavily polluted and one on one of the buildings on Hoffman Island where the air is comparatively free from dust and smoke. So far but 2 months' records are available but these show a large absorption of light by the atmospheric pollution depending upon the time of day and sky conditions.

The Service has published a very valuable paper on the problem of posture, and an exceedingly valuable bibliography on the literature on this subject has been published in *Public Health Reports*.

Studies on occupational dermatoses, pneumonia among steel workers, industrial absenteeism, illumination in post offices, and coöperation with the Bureau of Standards and the Bureau of Mines have been continued throughout the year. For more detailed information concerning the results of many of these studies the reader is referred to the present report and various papers which have been issued during the past year either in the reports of the U. S. Public Health Service or as bulletins of this office.—Government Printing Office, Washington, 1927. L. G.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Studies On the Effects of Abundant Cereal Intake—Cereals ordinarily used in the household and supplements readily obtainable at the grocery store were fed in combination to experimental albino rats in order to determine the efficacy of cereal supplements other than milk or milk products. The cereals represented were oats, wheat and corn—three different diets in which the cereal was present in amounts of 65 per cent, 80 per cent and 93 per cent respectively. Oatmeal, whole wheat and yellow corn meal represented the cereals. The supplements were whole egg (substituted by egg yolk in the 93 per cent diet), molasses and fresh lettuce. Oatmeal and whole wheat diets furnished the best growth in the 65 per cent series, with yellow corn meal almost as satisfactory, the growth in all cases being better than the conventional "normal." In the 80 per cent series the growth was good to excellent, limited somewhat by the protein content of the ration, the corn meal being again not so satisfactory as oatmeal or whole wheat. In the 93 per cent diet in all cases the growth was barely equal to normal; in the case of yellow corn meal it was below, probably due to low concentration of protein. No signs of rickets were observed, nor any evidence of faulty dentition or vitamin deficiency. In breeding fifteen females on the 80 per cent cereal ration, one only failed to have a litter. The growth rate of the young of these females indicates that the rations satisfactory for growth after the weaning period, are not entirely sufficient for the period of lactation, many of the young being markedly underweight at the time of weaning. The authors conclude that while the 65 per cent series

indicates satisfactory growth, reproduction and lactation, with supplements other than milk, and that growth may be maintained with the 80 per cent level of cereal intake, the experiments are not sufficiently extended in view of the number of substitutes available to determine any general opinion. In all the experiments the cereal rations were cooked before feeding. Comment is made that the ability of man to maintain growth on a large cereal diet is indicated by the Chinese, in whose diet, according to Wu, cereal constitutes 66 to 72 per cent of the calory intake. According to the same authority, this diet is considered adequate except with respect to calcium and milk is as a rule not available as a supplement to the cereal.—George R. Cowgill, Margaret H. Jones, Robert A. Frisch, and G. P. Jackson, *J. A. M. A.* 89:1930 (Dec. 3), 1927.

Study of Tubercle Bacilli in Milk—Meanwell feels that results obtained with artificial cultures of the tubercle bacillus ought not to be accepted as criteria of those which would be obtained with naturally infected milk. Therefore, all his studies were made on milk proved to contain tubercle bacilli by animal experimentation. A temperature of 62.8°C. (145°F.) for thirty minutes does not invariably kill the tubercle bacillus in naturally infected milk, although in most cases this temperature is effective. At a temperature of 60°C. (140°F.) for twenty minutes, tubercle bacilli are in many cases destroyed, but this combination of time and temperature leaves no margin of safety.—L. J. Meanwell, *J. Hyg.*, 26:392 (Oct.), 1927. Abstr., *J. A. M. A.* 89:2072 (Dec. 10), 1927.

Rats and Mice As Disseminators of Typhoid B Bacilli—Organisms of the typhoid B group were found by Friesleben in the feces of large numbers of healthy slaughterhouse animals, but agglutination tests indicated that the types present were not pathogenic to man. Paratyphoid B organisms isolated from the feces of 52 per cent of fifty wild mice and 19 per cent of 100 wild rats, on the contrary, were indistinguishable culturally or serologically from the types pathogenic to man.—M. Friesleben, *Deutsche med. Wchnschr.*, 53:1589 (Sept. 16), 1927. Abstr., *J. A. M. A.* 89:2075 (Dec. 10), 1927.

On the Nutritive Value of Bread—Previous workers have demonstrated the meager vitamin B content of the ordinary white flour with the obvious corollary that white bread is an unsatisfactory article of diet if it constitutes a large portion of the intake as it does in so many families of limited means. Experiments have been recorded by Hartwell presumably confirming the contentions made by others that white bread is satisfactory owing to the vitamin B content of the yeast. The work herein recorded was undertaken to demonstrate the accuracy of statements with respect to the adequacy of white bread and to determine the relative vitamin B content of different portions of the wheat as a result of milling. Experiments were conducted on rats weighing from 70 to 100 g., whose weight and temperature were taken exactly at the same time each week and were kept on a basal ration completely free from vitamin B. In the opinion of these investigators the lowering of the body temperature is a more sensitive indicator of vitamin B deficiency than the weight record, provided the animals are kept in a room at a fairly even and warm temperature. It was found that of all of the products of wheat the germ is richest in vitamin B, equaling, if not excelling, yeast in that re-

spect. Rating the germ as 100 in vitamin B content, then the other products range as follows: middlings 50, bran 33, white flour 0, and yeast 100. It was found impossible to furnish vitamin B sufficient to maintain growth in rats when white flour was used as its sole source. White bread would have to be fed in the proportion of 250-500 per cent of the basal ration, whereas whole meal bread would be satisfactory in amounts from 30-60 per cent of the basal ration and a wheat flour germ bread if constituting 20-40 per cent of the basal ration. It is concluded that the so-called brown breads consisting of considerable bran are not entirely dependable as a source of vitamin B since the so-called "brownness" of the bread is not always proportional to the vitamin B content. It is further argued that the dietary effect of a bread made from a mixture of a patent white flour and the germ is more easily assimilated and furnishes a more adequate supply of vitamin B than the breads made from white flour with a liberal addition of bran. It is suggested that the vitamin B content furnishes a more definite stimulus to peristalsis than does the indigestible bran.—W. Cramer and J. C. Mottram, *Lancet*, 21:1090 (Nov. 19), 1927.

Incidence of Carriers of *B. Aertrycke* (*B. Pestis Caviae*) and *B. Enteritidis* in Wild Rats of San Francisco—Attention is called to the incidence of carriers of food poisoning types of bacteria in wild rats as part of a study of certain factors which may possibly be responsible for food infections and food poisoning outbreaks. In an effort to establish the existence and the incidence of rat typhoid in the rodent population of San Francisco, bacteriological examinations of 775 rats were conducted which revealed 58 rodents infected either with *B. enteritidis* (28 cases) or *B. aertrycke* (30 cases.) At least 2 per cent of the rodents were capable of

shedding highly virulent bacilli. As no rat virus baits had been distributed in the districts from which these animals came it was concluded that the rats were suffering from natural infection. The carrier rate was found to be fairly uniform throughout the city and was 6 per cent in the vicinity of food handling establishments. It is further stated by the authors that it is likely that as San Francisco has a vigilant rat extermination service the conditions encountered there should not be considered as representative of the prevalence of rat typhoid in other large communities.—K. F. Meyer and K. Matsumura, *J. Infect. Dis.* 41:395 (Nov.), 1927.

Effect of *Cl. Sporogenes* On Toxin Production by *Cl. Botulinum*—Conflicting statements by various investigators regarding the effect of other organisms on the growth and toxin production of *Cl. botulinum* led to the experiments reported here which were conducted to ascertain the effect of *Cl. sporogenes* on *Cl. botulinum*, grown in vegetable as well as in meat medium. Asparagus, spinach and meat media were used. In every meat tube *Cl. botulinum* liberated sufficient toxin to kill a guinea pig irrespective of the number of *Cl. sporogenes* spores present. The inoculation of an equal or greater number of *Cl. botulinum* with *Cl. sporogenes* in spinach medium produced toxin with but one exception, when only a hundred spores of each were used. In a few cases the introduction of an overwhelming number of *Cl. sporogenes* spores did not prevent the development of toxin. The deleterious influence of *Cl. sporogenes* is most marked in the asparagus medium. In all three mediums the toxin strength is gradually diminished by increasing the number of *Cl. sporogenes*. The metabolic products of *Cl. sporogenes* are probably not injurious to botulinum toxin since the supernatant fluid of a culture of the non-toxic anaerobe, when added to botulinum

toxin, did not destroy it. Planted together it is not unlikely that *Cl. sporogenes* and *Cl. botulinum* contend for the same food substance, some of which may be necessary for toxin production, and if *Cl. botulinum* fails in securing it little, if any, toxin is formed. The spore suspensions of *Cl. botulinum* and *Cl. sporogenes* inoculated in varying relative amounts into meat, spinach and asparagus mediums, were incubated for 10 days before testing for the presence of toxin.—E. Wagner Sommer and Kathryn Glunz, *J. Infect. Dis.* 41:442 (Dec.), 1927.

Bacteria Concerned in the Spoilage of Haddock—In studying spoilage of Atlantic Coast haddock, the author, found that the predominating organisms isolated from the slime and muscle of the fish were Gram-positive rods constituting a single individual species in the *subtilis-mesentericus* group which is capable of existing in at least two distinctly different modifications. The hypothesis was advanced that the two forms are an example in the *subtilis-mesentericus* group of the rough-and-smooth (R and S) type of bacterial variation observed by numerous investigators of other groups of bacteria. Cultural studies were made of 38 strains of the fish organism grown from single-cells, special attention being given to the differentiation of S and R forms. The strains producing smooth colonies (S type) were asporogenous while the rough or "inactive" strains (R type) produced spores, both types breeding true through several successive transfers in broth and agar alternately at 24-hour intervals. It was possible to convert the R type to the S type and vice versa. The "active" form (S type) which was isolated repeatedly from stale fish muscle was assigned a share in the mechanism of spoilage. The organism studied is designated by the author as *B. "mesentericus-vulgatus"*.—A. H. Gee—*J. Infect. Dis.*, 41:355, (Nov.), 1927.

CHILD HYGIENE

MERRILL E. CHAMPION, M.D.

Maternal Mortality in the United States—Twenty nations offer data in regard to maternal mortality rates. Among these the United States ranks 19th, Chile being the only civilized nation that shows a higher death rate from accidents and diseases incident to child-birth. Our rate runs one-third higher than that of England, and Wales and more than twice as high as Denmark, Italy, Japan, Netherlands, New Zealand, and Sweden. Even with allowance for statistical error and varying methods of computing rates, women in the United States are not assured of the safety they have a right to demand and which we should be able to give. There has been no improvement in the last 10 years, the rate being 6.1 per 1000 live births in 1915 and 6.4 in 1925, an increase in fact.

Because of this state of affairs this study was undertaken, the proportionate causes of maternal deaths being first summarized. In the death registration area of the United States during 1921 over 40 per cent of all maternal deaths were due to puerperal septicemia. As this is regarded as a preventable cause this 40 per cent can be wiped out; 27 per cent were due to "puerperal albuminuria and convulsions," which condition is felt by all to be at least partly preventable; 10 per cent were due to instrumental and surgical delivery including Cesarean section; the remaining 23 per cent were due to the so-called accidents of pregnancy which included abortion, ectopic pregnancy, puerperal hemorrhage, embolus, puerperal phlegmasia dolens and "certain ill-defined causes." Dr. Baker studied the midwife question to some extent, and while she did not consider the survey complete,

found that the comparative data collected from the various states did not show that the midwife could be held responsible "as a dominant factor in the present high mortality rate", moreover a lessening in the number of births represented by midwives is reported by 22 states.

Hospitalization would seem to be one of the ways in which puerperal septicemia could be decreased but we still fall far short of an adequate number of beds for maternity patients as for all others. Enforced reporting of puerperal septicemia, better obstetrical training in all medical schools, and more facilities for prenatal care, are all considered. Sixteen states have laws making puerperal septicemia reportable but public health authorities have done little with it so far.

Even the best prenatal care will never take the place of skilled obstetrics as Dr. Baker points out, but it has a marked influence in reducing maternal mortality in all city groups where it has been tried out, the rate being cut down from one-half to two-thirds of the figure for the city as a whole.—Josephine Baker, M. D., Dr. P. H., *J. A. M. A.*, Dec. 10, 1927.

Mothers and Babies in New Zealand—New Zealand's *Annual Report* for the year ending March, 1927, states that she still carries the lowest general death rate (not given) and the lowest infant death rate—39.76. The infant death rate has declined slightly in the past year. This decline came in the neonatal period and slight as it gives us some courage. The present neonatal rate is 64 per cent of the total infant death rate, the causes given being prematurity—roughly $\frac{1}{2}$; debility and like causes $\frac{1}{10}$; malformations

1/10; birth injuries 1/20. The stillbirth rate has risen steadily 9 points in 5 years, "at the same time as the live-birth rate has consistently declined." (In all considerations of neonatal deaths and stillbirths we have to bear in mind that there are still variations in definition of the term "stillbirth.") Maternal mortality is recorded as 4.25, with an average during the years 1921-1925 nearly one unit above the average. Fifty-seven per cent of the deliveries occurred in hospitals. The average forceps delivery rate for New Zealand hospitals is 14 per cent of all cases delivered.

The department reports plans on foot for new equipment and accommodations in hospital service, a standardized aseptic routine, extended training for midwives, etc. and expects from all a decline in hospital mortality rate as a result.—*Pub. Health*, London, Dec. 1927.

Breast Feeding—Minneapolis puts out an interesting and valuable report on breast feeding. The summary of local factors influencing infant mortality is particularly good. We are somewhat surprised to see included these statements: "In Minneapolis city water need not be boiled to render it safe for babies," and "all milk distributed in Minneapolis is pasteurized or from certified cows," which would seem to indicate that boiling water and milk for babies is considered quite unnecessary in any case. The report does not state how many babies were receiving both bottle and breast feeding but says: "Breast feeding includes all babies receiving any breast milk." Methods being employed in the campaign are discussed. Here, as elsewhere early infant mortality has not been affected. Deaths under 1 month were 57 per cent of the infant deaths for 1926. (Compare 67 per cent for New Zealand.) The author feels that "more and more the application of breast feeding is proving that maternal milk secures for the baby a permanent foundation for

a healthy childhood."—Helen Chesley Peck, *Pub. Health Nurse*, Dec., 1927.

Influence of Pregnancy On Teeth—Another interesting contribution to this very important subject is presented in the December issue of the *Dental Cosmos* by Dr. Guttorm Toverud of the State Dental Institute of Norway. This article includes a fine summary of the work that has been done along this line in various countries as well as the results of the author's experiments on rats "to see if pregnancy even under normal nutritional conditions might change the chemical composition of the teeth." The conclusions presented are as follows:

1. Histological and chemical changes are found in bones of pregnant women.
2. Lowering in blood and saliva calcium are found during the latter part of pregnancy.

Both of these conditions may be the result of a faulty calcium metabolism caused by an insufficient intake of calcium, or by a disturbance in the function of some of the endocrine glands. Furthermore, this point of view is supported by:

3. Experimental studies showing that the mother during pregnancy has to give off some of her own calcium from the hard tissues when the intake is insufficient to cover the need of the mother as well as the need of the fetus.
4. The experiments on rats described in this lecture, which show that rats fed a calcium- and vitamin-deficient diet (also containing a toxic factor) during the gestation period developed front teeth of a very inferior chemical composition.

The practical conclusion which may be drawn from this preliminary study is: A liberal intake of lime corresponding to the content of about one liter of milk daily (1.2g. Ca) and a liberal intake of the vitamins necessary for the utilization of the lime, viz., uncooked fruit, green stuffs and milk (and cod liver oil), will be of invaluable help in conserving the teeth of the pregnant mother.—Dr. Guttorm Toverud, *Dental Cosmos*, Dec. 1927

Dental School Clinics in Germany
—The Association of German Municipalities recently published in its official organ the results of an investigation into public provision for the care of the teeth of elementary school children in its member cities. The general conclusion is that the cities are giving an increasing amount of attention to this subject.

The study covered 92 cities having a population of over 50,000. Fifty of the 92 cities maintain their own dental clinics for school children. In the cities not having municipal dental clinics other arrangements are made, such as examinations and treatment provided either at the university clinic or paid for from sickness insurance funds. In many cities dentists in private practice are engaged by the authorities to give dental care.

In addition to being provided in elementary schools, dental treatment is given in an increasing number of compulsory continuation schools. At the time of the investigation mentioned above at least 28 cities were providing such treatment.

The cost of this work is met almost entirely by the municipalities. In several cities subsidies are also given by social insurance funds. A very small fee is paid by the parents in some cities. —*Zentralbl. f. Jugendrecht und Jugendwohlfahrt*, Berlin, Sept. 1927, p. 157.

Tetanus Following Vaccination Against Smallpox and Its Prevention

—Whenever the subject of vaccination is brought up some one is very apt to have a story to relate of a very sore arm having resulted from that procedure. As such stories circulate, additions are occasionally made and we finally learn that the arm was lost. These lost arms are exceedingly difficult to find. There is no denying the fact, however, that very sore arms do at times follow vaccination. The unfortunate part of the whole matter is that people are very apt

to blame the procedure itself for these results, and not the method employed in vaccinating, or the way in which the vaccination was or was not afterward cared for. Most, if not all, of the excessively sore arms are due to improper vaccination technic or to improper after care or lack of after care. Vaccination is a form of minor surgery and deserves the attention and care accorded any other minor injury.

The occasional cases of post-vaccination tetanus while relatively rare are a much more serious sequel. Among the thousands of vaccinations which must have been performed, only two such cases are known to have occurred in Massachusetts last year. In both instances, the cause was very evidently faulty after care.

In a recent number of *Public Health Reports* (Dec. 16, 1927), Dr. Armstrong of the U. S. Public Health Service presents the evidence, gained through case investigations and laboratory experiments, concerning post-vaccination tetanus. He concludes that such infection is due either to infected bunion pads used as dressings or to the presence of the specific organism at the site of vaccination, either at the time of vaccination or through subsequent contamination of the vaccination area. His summary is as follows:

1. Epidemiological evidence is presented which indicates that post-vaccination tetanus, when it develops, tends to follow severe primary vaccinations performed with large insertions and dressed with some type of shield or covering strapped to the site.

2. Shields and dressings are shown markedly to predispose to the development of post-vaccination tetanus in monkeys and rabbits vaccinated with virus artificially contaminated with *B. tetani*.

3. A proper vaccination is defined as one in which the insertion is not over one-eighth inch in its greatest diameter, made by some method which does not remove or destroy the epidermis. Such insertions treated openly, i. e., without the use of shields or dressings strapped to the site, have never, in so far as we are aware, been followed by post-vaccina-

tion tetanus. It seems probable that the adoption of these simple procedures of technic on the part of vaccinators, coupled with a proper warning to the vaccinated individual, or his parents or guardian, concerning the dangers of home applied shields and dressings, would eliminate tetanus as a complication of vaccination.

To carry out a proper vaccination as defined above, the following procedure is suggested:

1. The site should be the insertion of the deltoid.

2. Cleanse the skin thoroughly but gently with acetone or 70 per cent alcohol (denatured alcohol should not be used) and allow to dry.

3. Use the Kinyoun or multiple pressure method of insertion through a drop of virus expressed upon the skin; make horizontal pressure with the point of the needle 20 to 30 times. The skin should be held taut and the area of the insertion not over one-eighth inch in diameter. A new, sharp, flamed needle should be used. The virus is wiped off immediately afterward with sterile gauze.

4. After care—no dressing is applied at the time of vaccination or subsequently, unless an open lesion develops following the formation of the vesicle. Under such circumstances, a large antiseptic dressing is strapped loosely over the vaccination, the adhesive straps being applied well away from the vaccination site. Under no circumstances should shields or other forms of dressing than those specified be used, and such care should always be given under a physician's direction. The vaccination should be followed by the physician during its entire course, not only to determine the immunity status, but to insure the proper after care necessary to prevent complications.

—Charles Armstrong, *Pub. Health Rep.*, Dec. 16, 1927.

The Early Diagnosis and Non-paralytic Anterior Poliomyelitis— Much interest has been aroused in the recent outbreak of poliomyelitis in Massachusetts. In view of the confusion in regard to the nonparalytic form of the disease, the author discusses the early diagnosis based on a large number of observations during the summer. The typical onset and course of the acute stage is described.

The assumption that the disease may stop at any point in its development

offers an explanation for the abortive type, where there is a generalized infection with the virus of anterior poliomyelitis, which does not go on to localization in the central nervous system; the nonparalytic type where there is a demonstrable invasion of the central nervous system both by physical signs and lumbar puncture, but where no discoverable paralysis ensues; and the paralytic type where there is invasion and injury to the central nervous system, with the characteristic and oftentimes crippling paralysis, which gives the disease its interest and its dread.

The author paints a picture of the symptomatology and physical signs of the nonparalytic type and the pre-paralytic stage of the paralytic type which very often permits the making of a definite diagnosis.

A tentative diagnosis of poliomyelitis having been made, the diagnosis is confirmed by an examination of the spinal fluid. The pressure is usually increased, there is an increase in cells up to 700 or 800, and the fluid presents a ground glass appearance. The sum of this information makes the differential diagnosis not difficult.

The author points out the impossibility of determining whether or not a case will become paralyzed, as well as lack of information as to the ratio of paralytic and nonparalytic cases. He summarizes as follows:

1. In the present state of our knowledge the prevalence of the abortive case of poliomyelitis as previously defined must remain a matter of conjecture. It is the type of case more often heard about than seen.

2. The nonparalytic and paralyzed case are alike in their onset, and can be diagnosed accurately in the majority of cases in the absence of or before the occurrence of paralysis.

3. The nonparalytic case as defined in this paper probably does not constitute a very large proportion of the total number of cases.

—Eliot H. Luther, M.D., *Boston, M. & S. J.*, Dec. 22, 1927.

PUBLIC HEALTH NURSING

MIRIAM AMES, R. N.

ARE YOU SATISFIED WITH THE ANNUAL REPORTS YOU RECEIVE?*

OVER the desk of any organization executive pours a stream of annual reports. Some are glanced at, some read through, and occasionally there is one whose contents are studied with a searching eye.

Several executives decided in 1924 that these reports would be more valuable if it were possible to have more uniform methods of preparing them so that one organization might place its figures beside those of another, make trustworthy comparisons and draw conclusions therefrom. The committee which was later appointed prepared an outline and made a report in 1925 which resulted in the addition of new members to the committee to represent the smaller communities. At the 1926 meeting, it was decided that the report should be published in the professional journals asking interested workers to submit any further recommendations which they might wish to make. Such a summary appeared¹ in the *Public Health Nurse* of May, 1927. Apparently there is no desire on the part of workers to add to this material. It would be justifiable to assume that public health workers are satisfied with the reports they receive, or at least that they are basing their hopes for improved conditions on the apparent change that is taking place.

The trend in content of reports during

the past few years should hearten even the pessimist. After all, why should we expect changes in style only in the picture section of the report? The picture of a nurse, which appeared and reappeared as the frontispiece of a report from one of our large organizations in the years of 1912 and 1913, is in marked contrast to the one which appears in the picture section of this year's report from another large city organization. Our first reaction to these pictures is to laugh and to think how absurd it was to climb about on tenement stairs in skirts of such length. How much more attractive and comfortable our nurses appear in modern times, and how much more universal is a businesslike uniform in organizations all over the country. In the "hat pin age" there were many public health nurses who went about in the homes in ordinary street clothes. (See Newark, 1912.)

The change in fashion is quite significant of the changes which have taken place in the general content of the report. With the long skirts of those days we were apt to find the long narrative of the nurse's work and the long list of "donors," etc. Today, when modern advertising, moving pictures and radios have taught us that the public will only grasp what can be seen at a glance, we have the concise, business-like statement from the president and director, the single page of large-typed totals for statistical material and the balance of the report made up of well chosen pictures, all of which give a concise story of the work. (See Boston, 1925).

* This paper by Marguerite A. Wales, R.N., was presented as the Report of the Committee on Standard Forms for Annual Reports of Public Health Nursing Associations or Groups, to the Public Health Nursing Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 20, 1927.

Prof. Ira V. Hiscock has stated in his admirable paper which appeared in the April, 1927, *Public Health Nurse*,² that a report must be prepared for four principal groups of people: the supporting public, the board which is responsible for management, the staff, other public health workers, etc.

Most of the supporting public will only be interested in the story which makes its appeal in a striking way—hence the resort to modern advertising methods. The board responsible for management will be interested in figures on the financial page and the statistics, with a brief story of growth and plans for the future. From the new topics creeping into the president's reports, referring to national public health projects, we see the effect of the layman's place in our public health organizations (see Toledo, 1926), and we can count more and more on a board which will understand our problems. The staff, of course, we should assume will be interested in the same sort of material as that prepared for "other public health workers." Until recently the fourth group, which represents the reader who studies reports with professional interest in comparative tables and development of programs, has been the most neglected one.

In the past, these comparisons have been difficult to make because of lack of uniformity in terms. What has been the distinction made between "cases" and "patients" in statistical reports? How should tuberculosis *contacts* be recorded? In an association doing child welfare work, and therefore carrying a large number of well children who could not be discharged, should the records be based on *admittances* or on *discharges*?

These problems brought about the appointment of this committee. The work of "defining terms" has been left to the Record Committee of the National Organization for Public Health Nursing, which has made up record

forms which are being tried out in many organizations all over the country.

During the years since the N. O. P. H. N. Visiting Nurse Service Study,³ organizations have been making much better analyses of their work and we begin to see a change in the annual report. Cleveland, we believe, was the first organization to introduce figures from a "time study" into the pages of its report. Immediately other organizations began to compare notes. "If Cleveland spends so much time on this or that phase of work, how do we compare?" they began to ask, and these questions gradually crept into print. Later, Detroit presented a comparative table from a number of organization figures which was very helpful. We find ourselves saying: "If Detroit spends 56.9 per cent of its time in maternity work, how much time per visit do their nurses average in the care of a maternity patient?"—and so on.

Today, we are getting a basis of study, and the annual report will come to be the exchange of program and general plan which will lead us to a better understanding of the city programs. With health departments using the *Appraisal Form* more and more and bending their efforts toward defining standards, surely the nursing organizations must work toward some means of comparing their work and how it fits into the city picture, and this can be greatly facilitated by a standard form of annual report. With this in mind, we shall review here the points which the committee agreed upon as desirable in an annual report.

The reports should contain a general report from the president or director stating the principal aims of the organization, based presumably on the needs of the community. The Visiting Nurse Association is the key group to study morbidity situations and much valuable data could be prepared by taking groups of diseases and trying to establish a mor-

bidity rate according to age. The layman who is giving his support to such work will find much of interest in figures which show just how far his money will go in meeting the community demands.

The report should contain an outline in brief of the various branches of the service instituted to carry out the aims; for instance, the statement here could contain information as to whether the organization carried solely a staff for acute sickness situations, or whether it included: acute sickness, chronic sickness, maternity, clinic service, health education, and public health teaching. Statistical material should be presented in connection with the various services; for example, the number of staff apportioned to each service (obtained from number of hours, for a generalized service); amount of time spent in each service; and per cent distribution of the entire work among the various services.

This might seem an appropriate place in which to enter a brief survey of the community facilities and a justification of emphasis on any one or more branches of the organization's work. The number of cases and visits should be listed in age groups and nationalities; the morbidity and mortality statistics by disease groups; the duration of visits and number of visits by diseases (see Dr. Louis I. Dublin's "Records of Public Health Nursing" for a uniform method of tabulation of statistics above mentioned). Reports should clearly define the organization's policy in regard to the content of a visit; that is, when a nurse is carrying a prenatal patient under her supervision, if this supervision is carried on by correspondence rather than by personal visits, it should be so stated.

There should be a statement of budgets and costs. The items of budget to be included and how these should be entered and defined are covered in the Report of the Committee to Study Visiting Nursing." Statistical material based on the suggestions of this report would af-

ford also a detailed study of the costs of various services if an organization were equipped to gather and tabulate this additional data.

In this connection, the following might be suggested as valuable and interesting where possible to obtain: time spent in each function which the nurse performs, that is, office, travel, assigned duties, clinic work, field work, and, further, time spent in different types of field work; costs of service time (using such a unit as the hour for a basis; from this could be readily computed the amounts expended on maternity work, on acute sickness visiting, etc.); type of work accomplished; number of visits by type. The report should include a statement of the future plans of work and recommendations for the progress of public health work in general.

In conclusion, then, we might say that while we find the annual reports of some organizations including just the type of figures needed to make comparisons easy, other organizations should be encouraged to follow this general outline so that workers all over the country may benefit by comparisons of work and programs.

COMMITTEE

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4. Dublin, Louis I. Records of Public Health Nursing. *Pub. Health Nurse*, 13, 8:385 (Aug.); 13, 9:454 (Sept.); 13, 10:518 (Oct.); 13, 12:637 (Dec.), 1921; 14, 1:17 (Jan.), 1922.

Hourly Nursing—Hourly Nursing, or the appointment service plan, is being given considerable thought by Visiting Nurse Associations all over the country. There are at present four methods of administration in vogue. In certain cities, the entire service is carried by the visiting nurse staff, in others there is a joint scheme worked out with the central registry for nurses, in still others the registry carries the service alone, and of course there is the "free lance" nurse.

The Public Health Nurse for January, 1928, is publishing follow-up material on the study made by the Statistical Department of the National Organization for Public Health Nursing in August, 1927. This material includes an excerpt from Dr. Winslow's report* on the progress of the Grading Committee as given at the A. P. H. A. meeting in Cincinnati, and a bibliography on the subject, which we quote here. Other articles and discussions are to follow.

Four "Close-ups" of Hourly Nursing. *Am. J. Nurs.*, June, 1925, p. 721-727.

Open Forum. *Am. J. Nurs.*, Jan., 1927, p. 61.

Hearsay and Facts in Private Duty. J. M. Geister. *Am. J. Nurs.*, July, 1926.

Twenty-four Official Registries Provide Hourly Nursing for Public; Interesting Two Years' Registry Experiment in Buffalo, N. Y. *Anagrams*, Feb., 1927. American Nurses' Assn.

Hourly Nursing in Public Health Nursing Associations. L. M. Tattershall. *Pub. Health Nurse*, Aug., 1927. p. 397-401.

Hourly Nursing (abstract of paper). M. E. Edgecomb. *Pub. Health Nurse*, Aug., 1927. p. 401-2.

Chicago's Hourly Nursing Service Aids Convalescents. *Nation's Health*, Aug., 1926. p. 560.

Nursing Care by the Hour or by the Day. E. Van Ness. *Nation's Health*, Aug., 1927.

Nursing the Community. N. Deutsch. *Pacific Coast J. Nurs.*, Dec., 1926.

Mrs. Citizen Wants a Nurse. *Pacific Coast J. Nurs.*, Jan., 1927.

Hourly Nursing in Philadelphia. A. C. H. A. *Bull.*, Jan., 1926. p. 13.

One Way Out. D. Deming. *Survey*, June 15, 1926, p. 377.

Bulletin, Chicago Health Department, Aug. 17, 1926, p. 210.

Washington, D. C. Instructive Visiting Nurse Society Report, 1925, p. 10.

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D. D.

Buffalo Conference On Family Life in America—The Conference on Family Life in America, held in Buffalo in October, 1927, dealt with many problems closely related to the health of the family and individual—the meaning and use of leisure, spiritual factors in family life, the ideals of marriage and parenthood, and most interesting perhaps, the changing basis of family support and expenditure. This last was dealt with very ably by Paul H. Douglas of the University of Chicago. He said in part:

The family as a consuming unit will in all probability, despite certain obviously opposite forces, continue indefinitely. In the future, however, increasingly large numbers of men and women will earn their living as individuals within the family. This individualistic way of securing income, and the largely combined method of expenditure, present some interesting prospects.

Will the employed children contribute to a common fund? Many now retain their earnings and live on a far more expensive scale than others of their economic class. They are young, and spend for luxuries what is spent by others on necessities. This scale of living unfits them for marriage, and the proper physical and spiritual care of children. Another result is the added weight of responsibility on the mother and father, and younger children, who are often deprived of the basic needs in family life because the older children fail to pool their earnings. The most overworked and exploited members of society are the working-class mothers of two or more children. Even their food is often cut below the level of decency and efficiency. No labor laws have been enacted for them! Adjustment of wages to number of children supported has been suggested, but bears with it many objections. The writer feels strongly that bachelors and childless couples have not so great a demand on industry as the family, which is rearing the next generation, and which is therefore returning to the nation manpower of definite economic value.

D. D.

* This report will appear in the March issue.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

Group Thinking Better Than One Mind—In building new words from certain given words a group did better than individuals working alone, as reported by Goodwin B. Watson, of Columbia University, at the recent meeting of the American Association for the Advancement of Science. Dr. Watson granted that further investigations are necessary to ascertain whether groups are more effective in accomplishing more difficult tasks. The editor would call attention to the positive gains in many situations through group discussion *rightly conducted*. *Created Discussion*, revised edition, is a clear, untechnical guide in keeping group discussion from deteriorating into aimless talk. "It shows in sharp outline the principles by which any average group can open up an issue in ways to assure an orderly and searching procedure. Members of committees, conferences, and study circles will find in its pages new suggestions for making group experience rewarding."—*The Inquiry*, 129 East 52nd St., New York, N. Y. 63 pp. 50 cents.

Gains in 13 Years—"The American Social Hygiene Association, through its Division of Public Information, for 13 years has steadily developed and promoted ways and means for building up public opinion in favor of sound social hygiene measures. The results are apparent. Whereas, among most people, sex was formerly a subject discussed in whispers behind closed doors, social hygiene is now a leading topic of discussion in meetings and conferences every-

where. Where once it was difficult to get a hearing in schools and colleges, or before clubs and educational groups, today the association's staff of lecturers is engaged for months ahead. Our books are found in the regular stock of the average book-shop, thousands of requests for our pamphlet publications are received each month, and the *Journal of Social Hygiene* and the *Social Hygiene News* are available not only in libraries generally in this country, but abroad as well. There is a steady demand for motion pictures, lantern slides, posters and specially arranged exhibits dealing with social hygiene."—*Social Hygiene News*. "Public Information Number." 370 Seventh Ave., New York, N. Y. Nov. 30, 1927. *Free*.

"What Do You Think of It?"—Ask this question of the average individual and he will say that the annual report is "fine," the letter is "a winner," the meeting "was great." Most people do not like to criticise us and our products to our faces.

Getting small groups of people together to criticise frankly, to raise questions and to make suggestions is about the only method of getting at the honest judgments of the non-expert. And the sharing of such opinions stimulates the critical attitude toward our own material and stirs latent common sense which after all is enough to lead us to see many of the faults in our health education material.

Indoor Sport for Health Workers—Within a year or a little more six national and local New York agencies have made collections of health education

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

posters or of information about available posters, and several others have mimeographed lists on hand. Would it help to lessen duplication of effort if the editor of this department could announce when you are about to collect information or make up lists?

The National Health Library, 370 Seventh Ave., New York, N. Y., announces the compilation of a list of health education posters.

The National Health Library announces a revision of a list of health magazines of general interest and bulletins or house organs of national, state and local health agencies—principally of the public departments.

Copies of the National Health Library lists will be supplied upon request. *Free.*

The editor of this department announces the preparation of a list of national, state and local house organs and other periodicals in all health and other social and civic fields in the United States, Canada and other countries.

The editor announces a revision of lists of national, state and, to some extent, local agencies—health, social and civic—in this and other countries.

The compilers of the above lists will welcome coöperation.

Making a Survey Work—

No reform movement, or important change in the community's activities can be forced upon the community from the outside. Anything of permanent worth must come from a desire within the group for such a change or reform . . . Before the majority of the members of the community will have the same attitude toward any extensive change or reform, however, they will need to have the same insight into the local situation and the causes back of it, that the group of leaders who have been active in carrying on the survey have.

This insight into local conditions and activities and the possibility of improvement and greater efficiency will be reached by the majority of the community only when they have been given the facts in the matter. That is why the Publicity Committee has the most important work of the entire survey.

The object desired will never be reached by having published one or two formal reports

in the newspapers or a formal report in pamphlet form, no matter how valuable such a report may be. While these formal reports have great value, especially for comparative purposes and for the leaders of the various social agencies, they must be only a part of the general campaign of publicity which is carried on for the benefit of the local community.

In chapter on "Publicity" in *Technique of Social Surveys*, by M. E. Elmer. J. R. Miller, Los Angeles. Revised 1927.

Consultation with Specialists— Surveys and studies, investigations and reviews of many types are very common in the public health field. Frequently it is the department or volunteer agency of known efficiency and effectiveness that calls in a specialist or group of leaders in public health to look it over—a health examination, if you please, made for the same reasons as a physical health examination.

The same procedure is being followed in business and industry to a considerable extent. And now a writer in *Printer's Ink* argues for such an examination of the advertising department. See how the argument could apply to the publicity and educational work of a national, state or local health body:

What would have resulted? When a physician is treating a patient, the family or the man himself may worry over the lack of progress and begin to lose confidence. The doctor may be morally sure that he is doing all that can be done. But, if the case is critical, he often finds it to be good psychology to call in one or two other medical men and get their opinions. If they agree that the treatment is right, the patient and his friends are reassured and the doctor then has a fair opportunity to do his work. Doubtless the others can make certain helpful suggestions. Two or three heads are always better than one in medicine just as they are in anything else.

On the other hand, the consultation may develop something that had been overlooked, requiring the services of a specialist. In this case, the first doctor would naturally step aside.

Or perhaps there might be no dissatisfaction on the part of the patient or his family, but the physician himself might be worried over the progress of the case. He would be doing a wise and professional thing if, with the

consent of the family, he should call in a couple of other doctors and check over the case with them. Here the outcome would be substantially the same as before. If he were found to be on the right track, his confidence in himself would be increased and the patient's chances for recovery made better.

Such things are happening in the practice of medicine every day in every town.

Now That the Holidays Are Past—The time has come when many groups of health and other social workers might get together to talk over their annual reports, leaflets, meetings, etc. The New York Committee on Publicity Methods has already started a series of discussion meetings and self-clinics. To avoid speech making, to secure adequate group participation, and to have a friendly, intimate atmosphere, the sessions are limited to 20 or 25 people—the smaller number being preferable. The advance registration shows that two sessions each will be needed to handle some of the topics.

The New York Topics—Registrations have been accepted for the following topics:

- 1 Comparisons of costs of printing—Are we paying the right prices for what we get?
- 2 Problems in dealing with printers
- 3 Costs, qualities and uses of paper
- 4 Annual reports—a group clinic on reports of those present
- 5 The uses of dailies other than the metropolitan dailies
- 6 Our doubts or difficulties in dealing with newspapers
- 7 Press stories—a group clinic on press releases of those present
- 8 How can we evaluate results of our educational publicity?
- 9 How agencies are "Programming" their publicity
- 10 Comparison of functions included in publicity departments
- 11 Figuring costs of mail appeals
- 12 Sobs vs. reasons in money appeals
- 13 Difficulties in using outside publicity workers or bureaus and how the difficulties have been overcome
- 14 Film slides and continuous motion pictures
- 15 The uses of the multigraph and mimeograph

16 Problems of those doing state-wide publicity

17 Problems of those doing national publicity

The details on any topic will be sent to any one who wishes to organize a local group. Members of the Public Health Education Section of the A. P. H. A. who wish to attend some of the New York sessions will be supplied with registration blanks. Address: Committee on Publicity Methods, 130 East 22d St., New York, N. Y.

Baby's First Letter—The first letter received by most babies in Racine, Wis., comes from the Board of Health:

Dear little friend—

A happy birthday and many, many of them!

You think you are quite big, now that you are eating cereals, toast, butter and cooked fruits, besides your milk and orange juice; now don't you? And you have some tiny, white teeth, too.

What a big person you are getting to be! And just after this first birthday is the time to make your first visit to the dentist and to have a tooth brush all your very own just like the big ones Daddy and Mother have.

And while you are out to see the dentist, go to visit your doctor, too, or the baby clinic and ask all about the treatments which will keep you from having smallpox and diphtheria. Maybe the treatments can be started that very day—the sooner they are begun, the safer you will be.

Keep on growing strong, little friend, by eating the good things Mother gives you and sleeping 15 hours of the 24 in fresh air. Oh yes! And stay away from those people who have colds—colds may mean all kinds of sickness to you.

Again, I wish you a happy birthday!

Yours for health,

(Signed) W. W. BAUER, M. D.,
Commissioner of Health.

The letter is printed on a pleasing rough finish paper, 7- $\frac{1}{4}$ by 10 inches, with envelope 7- $\frac{1}{2}$ by 4 inches. Delivery is made by health department nurses on each first birthday. Says Dr. Bauer:

Births as they are reported, are indexed in a tickler date file a year ahead, and the delivery of the greeting is always carefully timed for exactly the baby's birthday, except that Sun-

day and holiday babies receive theirs on the last business day before the birthday. The cost is \$43.00 in quantities of fifteen hundred. For us this is a little more than a year's supply.

Linoleum Blocks Again—More effective than photographs for many illustrations in much health education and publicity are linoleum blocks. "Modern linoleum block printing is, in reality, the revival of one of the most ancient forms of printing."

How the Cornell College of Agriculture makes effective and inexpensive short runs of posters was told in the November, 1927, issue of the JOURNAL.

An illustrated working guide for making linoleum blocks for various printed forms appears under "Making Posters from Linoleum Blocks," by C. W. Smith, in *The Poster*, 307 South Green St., Chicago, Ill., Nov., 1927. 30 cents.

Detailed information is given in a delightful volume, *Essentials of Linoleum-Block Printing*, by Ralph W. Polk. Manual Arts Press, Peoria, Ill. 1927. 60 pp. \$2.00. Many a health worker would find that "the making and printing of linoleum blocks is intensely interesting work," and that "it is a real joy to create an original design, carve it in linoleum, and to obtain printed copies of it." Limited editions can be printed by hand, or an old-fashioned letter press can be used. The high school printing office may already be using the new-old art, and commercial printers can run the blocks in your printing jobs. Quite a few illustrations for health use can be copied, and probably art instructors can be enlisted. *We hope to exhibit a collection of linoleum illustrations at Chicago in October, 1928.*

RADIO

For dates of talks over station WEEI, address Mass. Society for Mental Hygiene, 5 Joy St., Boston, Mass.

There was little tuning off by those not discouraged by the dull title, "Heart

Disease," who listened in on Dr. M. M. Myers at Station WHO, Des Moines, Ia. "A Doctor, a Nurse and a Ford Car" would have been a better title. In The Campaign, Iowa Tuberculosis Assn., Des Moines, Ia.

"Three talks a week on guides to health and safety, embracing in detail the subjects of home hygiene, first aid and life-saving," were put on the air by the Pittsburgh Red Cross Chapter "in the 1926 enrollment, in addition to educational talks on Home Service, Junior Red Cross and general activities. Beginning October 4, some five weeks before Armistice Day, and ending on November 22, at the close of the campaign, these health talks were not on abstractions but on subjects of immediate interest to every parent with a receiving set. They included such matters as care of the baby, small child and school child; the cause and prevention of common ailments, proper diet, emergency care and treatment of the injured, and water safety and rescue work, as taught by the chapter staff. As a result of these radio addresses, the chapter received many inquiries from persons desiring to join classes. In any case, public attention was directed to the health education work of the Red Cross."—*Red Cross Courier*. Nov. 1, 1927.

For ammunition in dealing with radio stations, see the following:

"Broadcasting Buncombe" about health. Editorial review. *J. A. M. A.* Nov. 19, 1927.

"Station UCFL." Editorial on health exploitation. *Hygeia*. Dec., 1927.

"Can Radio Be Rescued?" *New Republic*. Oct. 26, 1927. The general situation and how it came about.

A REQUEST FROM BRAZIL

Dr. Euvaldo Diniz Gonçalves, Rua Morechal, Bittencourt, n. 15, Bahia, Brazil, writes for "some information about popular instruction of adult groups in matters of health; that is,

health publicity or health propaganda. As director of the division of health education in the state department of public health, I am interested to know the service done by the similar offices of that country. Will you have the kindness to ask for me some educational material and information regarding the activities of the state departments?"

Will some state departments write, and some local, state and national agencies send him examples of educational material? Please tell the editor when you have done so.

EDUCATIONAL MATERIAL

Public health workers or at least those who use health posters are invited to help the National Health Council make up a list of posters and placards available nationally. Ask the Council at 370 Seventh Ave., New York, N. Y., to send a copy of the "preliminary list" and then quickly write them your suggestions as to the information given in the list, and the omissions or inclusions to which you object.

An 8-page folder for mothers: Keeping the Well Baby Well. Children's Bureau, Washington, D. C., 1927.

Texts for teaching and materials for use are listed in *A Catalogue of Supplies and Books on First Aid and Life Saving*, 1927 (revised). American National Red Cross, Washington. *Free*.

The "what are Strep-to-coc-ci?" cards of the Onondaga Health Assn., Syracuse, N. Y., are being used by the Tuberculosis Society of Detroit, Mich.

A revised edition has been issued of *Plays and Pageantry*, the list of health plays recommended by the National Health Council. *Free* of National Tuberculosis Assn., 370 Seventh Ave., New York, N. Y. Gives synopses of 25 plays which are sold at 10 to 25 cents a copy. They are arranged in age groups: 5-7

years of age, 7-10, 10-12, 13-18, for older persons.

Eight pages of posters in color, 2 on prenatal care (from India and Russia) and 6 on child health (from China, Japan, France, etc.), accompany "Teaching Prenatal Care by Means of Posters," by Stuart B. Blakely. *Hygeia*, 535 North Dearborn St., Chicago, Ill., Dec., 1927. 25 cents. "The Russian prenatal posters are full of action, striking in color, beautiful in design, with the printed matter subordinate and even decorative."

A Long Life and a Merry One, by D. B. Armstrong. Metropolitan Life Ins. Co., New York, N. Y. *Free*. Reprint from *North American Review*. "The significant thing for the average man of today is not only that he lives 30 years longer than his forefathers of 1789, with much less illness and much more comfort, but also that he can today add 10 or 20 additional years to his life span."

Fifteen enclosures and four mimeographed pages (plus colored mimeographed cover) of ideas and references to material for use by New York local tuberculosis workers make up the second issue of *Do You Know?* Frances H. Meyer, Health Information Service, State Committee on Tuberculosis and Public Health, State Charities Aid Association (14 words in that name!!), 105 East 22d St., New York, N. Y.

If you wish to locate popular or scientific material on cleanliness—in the home, school, office, factory or community—it is likely to be listed in *Cleanliness: A List of Recent Publications*. Cleanliness Institute, 45 East 17th St., New York, N. Y., 1927. 30 pp. *Free*. Special attention is given to school material, stories, free or inexpensive material, both general and for school use. The binding of this mimeographed pamphlet may suggest a usable wrinkle.

LAW AND LEGISLATION

JAMES A. TOBEY, LL.B., DR.P.H. *

A MAELSTROM of measures descended on the Seventieth Congress between December 5, when it convened, and December 21, when it took its holiday recess. Out of some 8000 bills and resolutions introduced in both houses of Congress during the first two weeks of the session, a score or more are of considerable interest to sanitarians.

The Parker Bill—Without a change, Hon. James S. Parker of New York has reintroduced his bill for the coördination of federal health activities. It is now known officially as H. R. 5766, a number which should be kept in mind. This measure was introduced on the opening day of Congress and was referred to the Committee on Interstate and Foreign Commerce, of which Mr. Parker is chairman. This committee has referred the bill to a subcommittee headed by Hon. Carl E. Mapes of Michigan, which rather unexpectedly held hearings on the measure in January. Considerable opposition developed against the first section, giving the President power to transfer bureaus to the Public Health Service. The subcommittee is said to have deleted this section and reported the bill favorably with this and some other changes. At the proper time sanitarians will be asked to communicate with their Congressmen about it, as this measure has been indorsed by every leading national public health agency.

The Ransdell Bill—Senator Ransdell of Louisiana has reintroduced his bill for a national institute of health and it is now S. 871. This bill, which has been referred to the Committee on Commerce

of the Senate, is similar to the Parker Bill, but has an additional section authorizing an appropriation of \$10,000,000 for a national health institute, which would be established in the Public Health Service. The idea is sound and the bill has been indorsed by the A. P. H. A.,† but because of the appropriation feature, it may have a more precarious legislative course than the Parker Bill. This bill has also received approval from the American Chemical Society, and the Chemical Foundation has issued a pamphlet by Charles H. Herty entitled "The Ultimate Mission of Chemistry: Good Health," which contains a strong plea for the passage of Senator Ransdell's bill. Hearings on this bill are scheduled for the middle of March.

The President's Message—The Annual message of the President, sent by Calvin Coolidge to be read at the beginning of Congress, contained nothing at all on the subject of national health.

In transmitting the budget for the next fiscal year the President did take occasion once again to decry the system of federal subsidies to the states. He pointed out that federal interference in state functions can never be justified as a permanent policy even though it may be warranted by an emergency. "As shown in the Maternity and Infancy act," says Mr. Coolidge, "when once the government engages in such an enterprise it is almost impossible to terminate its connection therewith."

T. B. and V. D.—Any World War veteran afflicted with tuberculosis who brings such fact to the attention of the Veterans' Bureau prior to September 1, 1928, would be presumed to have acquired the disease in the service, according to

* Correspondence to the associate editor may be sent to him as follows: c/o The Borden Company, 350 Madison Avenue, New York, N. Y.

† See Resolutions, *A. J. P. H.*, Nov., 1927, p. 1163.

a bill, H. R. 5477, introduced by none other than Mr. Blanton of Texas. This measure would extend the present time from January 1, 1925.

A veteran who contracted a "social disease" while in the service would also be entitled to treatment under the terms of this bill, and this regardless of whether the disease was due to misconduct or not.

Another bill, H. R. 261, would grant federal hospital treatment to postal employes suffering from tuberculosis, nervous diseases, or mental occupational ailments.

A Federal Board of Alienists—A United States Board of Alienists, to be composed of twenty well qualified physicians, paid salaries of \$25,000 a year each, is proposed by Representative Black. This bill, H. R. 7936, states that the duties of the board would be to diagnose and treat mentally deranged veterans, study mental diseases generally, recommend a code of ethics for alienists, and inquire into insurance company methods of dealing with insanity. A modest appropriation of \$5,000,000 would be authorized for these purposes.

A Federal Safety Division—The present U. S. Bureau of Labor Statistics would be augmented by the creation within it of a Division of Safety, according to S. 1266, introduced in the Senate by Mr. Shortridge. This division would collect statistics on industrial accidents and analyze them, study labor safety plans, and investigate all phases of occupational hazards and diseases and their prevention. There is a proviso in the bill to the effect that such work shall be undertaken in coöperation with other federal and state agencies and no studies which are already being conducted shall be duplicated.

The work of the Bureau of Labor Statistics is described in detail in the *Monthly Labor Review* for December, 1927, 30 pages being needed for this

article. Among the activities of interest to sanitarians are those dealing with industrial safety codes, the industrial accident prevention conference, industrial hygiene, and the elimination of the manufacture of fireworks containing phosphorus. In the field of industrial hygiene the work includes publication of occasional bulletins dealing with industrial poisons or diseases; a review of current medical literature as it relates to occupational hazards, which is published each month in the *Monthly Labor Review*; and replies to many inquiries regarding specific poisons or hazards from gases, dusts, and fumes. Recent bulletins have been published on lead poisoning and health conditions in the printing trades.

Other Health Legislation in Congress—Among the other bills of significance to sanitarians are: S.1267, to extend medical and hospital relief to retired officers of the Coast Guard; H. R. 16, to regulate osteopathy, and H. R. 5763, to regulate chiropractic in the District of Columbia; S.762, to provide for a sanatorium at Claremore, Okla.; S.1602, to amend the opium importation act; S. 1865, to provide for the protection of municipal watersheds within the national forests; H. R. 5747, to authorize admission to naval hospitals of dependents of officers and enlisted men in need of hospital care; H. R. 5604, for additional hospitalization for veterans; H. R. 7951, to control diploma mills in the District of Columbia; and H. R. 487, to prevent the manufacture, sale, or transportation of adulterated, misbranded, poisonous or deleterious foods, drugs, medicines, and liquors.

Physicians in Congress—If the biographical data in the annual Congressional Directory is dependable, there seem to be only 8 physicians and 3 dentists among the members of the Seventieth Congress. As usual, the lawyers predominate, with a few farmers and business men among the elect.

The only physician in the Senate is Dr. Royal S. Copeland of New York, though Senator Woodridge N. Ferris of Michigan studied medicine for a year or two. Senator Henrik Shipstead of Minnesota is a dentist.

In the House of Representatives there are 2 M. D.'s from New York, Dr. John J. Kindred, who has been in Congress for five terms, and Dr. William I. Sirovitch, who is there for the first time. Dr. Kindred is also a lawyer. The other physicians include Dr. Frank P. Bohn of Michigan, Dr. Ed. M. Irwin of Illinois, Dr. William T. Fitzgerald of Ohio, Dr. J. Howard Swick of Pennsylvania, and Dr. John W. Summers, of Washington. There are also 2 dentists, Dr. R. O. Woodruff of Michigan and Dr. Frank Crowther of New York. Representative Stephen G. Porter of Pennsylvania studied medicine for two years but thought better of it and became a lawyer.

Caustic Poison Law now in Force—When the President approved the First Deficiency Appropriation Act on December 22, funds were made available for the enforcement of the Federal Caustic Poison Act, which became a law on March 4, 1927. The administration of this law for safeguarding the distribution and sale of dangerous corrosive and caustic acids and alkalies in interstate and foreign commerce is entrusted to the Department of Agriculture, acting through the Food, Drug, and Insecticide Administration.

Legal Use of School Health Records—Can school health examination records be used as court evidence? Are these records an open book for anyone to refer to at will? Has any legislation been passed anywhere which protects the schools from the use of these records by out of school agencies? These questions have been submitted to us by a student at Teachers College in New York.

It is the general rule in the law of evidence that, in the absence of a specific statute to the contrary, relevant public documents may be admitted as evidence in courts of law. School records are public documents and authentic health reports, submitted by physicians as part of their school duties, would be admissible as evidence. It is in the interests of justice to secure all pertinent facts bearing on litigation.

Whether school health records are open to the public for general inspection would depend upon local policies and rules. Public records are usually public, unless a law says they shall not be. Health records in schools ought to be open only to those who have a legitimate interest in them.

As to the existence of legislation on this subject, it would be possible to answer this question only after an examination of state codes. The associate editor would be pleased to learn of any statutes which deal with this important point.

Enjoining a Laundry as a Nuisance—A laundry which emits noises and odors, blocks sidewalks, and deposits soot and grease has been held to be a nuisance in California, *Williams v. Blue Bird Laundry Co.*, 259 Pac. 484. Instead of closing the laundry, however, the court upheld a decree enjoining the Blue Birds from operating in a manner deleterious to health. That the laundry had been a going concern for ten years in the same place was held not to stop nearby residents from suing to enjoin it from causing a nuisance.

Tests for Cod Liver Oil—The national government will soon take steps to remove from interstate commerce all cod liver oil which is misbranded or adulterated. A biological examination conducted under the auspices of the Food, Drug and Insecticide Administration has shown that many of the cod

liver oil preparations advertised to contain vitamins A and D were virtually devoid of A and sparse in D. Since cod liver oil is now so widely used to prevent and cure rickets, this is a wise measure by the government.

Additional evidence of the value of sunlight in preventing and curing rickets is presented in a news release sent out by the U. S. Children's Bureau on December 12, 1927. It is pointed out that children in Porto Rico, where there is abundant sunlight, seldom have rickets, a fact confirmed by examinations of 600 infants on this island.

Miscellaneous Items—In Virginia a court has held that a city has the right to adopt reasonable and necessary health regulations, *Etheredge v. City of Norfolk*, 139 S.E. 508.

Compulsory insurance against tuberculosis is provided in a decree approved

in Italy in October, 1927, according to *Child Welfare News Summary* for December 17, 1927.

A study of juvenile delinquency is recommended by the chief of the U. S. Children's Bureau, who urges that a division be created in the bureau for that purpose.

Anthrax is still a danger in different industries, according to the U. S. Bureau of Labor Statistics, which calls attention to 7 fatal and 75 non-fatal cases of an industrial origin reported in Pennsylvania from 1922 to 1926.

Midwife supervision in various foreign countries is described by Dr. George W. Kosmak in the *Journal of the American Medical Association* for December 10, 1927. In the same issue Dr. S. Josephine Baker reports that 16 states have laws making puerperal septicemia a reportable disease. Her article is on Maternal Mortality in the United States.

CONFERENCES

February 6-8, Council on Medical Education and Hospitals, A. M. A., Chicago, Ill.

February 6-8, Federation of State Medical Boards of United States, Chicago, Ill.

February 14-16, Engineering Institute of Canada, Montreal, Can.

February 16-18, Mid-West Conference on Child Study, Chicago, Ill.

February 23-24, Third New York Health Conference, New York, N. Y.

February 23-25, National Vocational Guidance Association, Boston, Mass.

February 27-29, National Society of College Teachers of Education, Cambridge, Mass.

February 27-March 1, National Association of Deans for Women, Boston, Mass.

March 5-9, American College of Physicians, New Orleans, La.

April 12-14, American Society of Biological Chemists, Inc., Ann Arbor, Mich.

April 12-14, Federation of American Societies for Experimental Biology, Ann Arbor, Mich.

April 17, North Carolina Medical Society of the State, Pinehurst, N. C.

April 30, May 2, American Pediatric Society, Washington, D. C.

April 30, May 2, National Probation Association, Memphis, Tenn.

April 30, May 5, National Congress of Parents and Teachers, Cleveland, O.

July 8-13, First World Congress of Social Workers, Paris, France.

July 16-21, Thirty-ninth Congress Royal Sanitary Institute, Plymouth, England.

BOOKS AND REPORTS

Interpreters of Nature—Essays by Sir George Newman, K. C. B., M. D., Hon. D. C. L., LL. D., New York: Oxford, 1927. 296 pp. Price, \$4.50.

All of us are familiar with the medical writings of Sir George Newman, who is justly regarded as one of the outstanding public health men of the world. It comes as somewhat of a surprise to many of us to find in this book a series of essays, some of which we would hardly have connected with medicine or the history of medicine. The author has shown the extensive knowledge with which we are so familiar, and in addition has given us a charming book made up largely of biographies of well-known men, though very few people would expect to find Keats included in this group. He is known to most of us only as a poet, and not as an apothecary or medical student, though we are told of certain discoveries which were made familiar to us eighty years later by the great Metchnikoff.

In such a book, it is hard to select any one or more essays for especial praise. Some readers had the honor of knowing Pasteur, while a large number knew the late Sir William Osler. It may be presumed that a great many readers will turn first to one or the other of these two essays. However, every medical man worthy of the name knows of the great work done at Padua, and the contributions to medicine of Sydenham, Boerhaave, and John Hunter. There is not an essay, nor even a page in any of the nine essays contained in the book, which is not worthy of careful attention. The style of the writer is exceptionally good, and the book as a whole can be heartily recommended both to the medical profession and to all who are interested in the advancement of medicine

or of mankind. The reading of such a book is not only extremely informative, but gives to the busy man a delightful change from the routine of his labors.

We would like to see added an essay on the life of that Prince of English physicians, Sir T. Clifford Allbutt, and a sub-title which would give a better idea of subject-matter of the book.

M. P. RAVENEL

Review of the Report of An Investigation of the Pollution of Lake Michigan in the Vicinity of South Chicago and the Calumet and Indiana Harbors 1924-1925—By H. R. Crohurst, and M. V. Veldece. Public Health Bulletin No. 170. Washington, D. C.: U. S. Public Health Service, 1927. 134 pp.

This survey, which was conducted over a period of one year, October 1, 1924, to October 1, 1925, was made in coöperation with the Sanitary District of Chicago, the Chicago Department of Health and the State Departments of Health of Illinois and Indiana. The report contains 134 pages, with numerous tables and diagrams illustrating the results of the survey. The studies show gross pollution of the waters at the southern end of Lake Michigan by industrial wastes and sewage largely from sources in northern Indiana, especially from the U. S. Ship Canal at Indiana Harbor. The Calumet River was also found to be a factor in the lake pollution. The degree of pollution is such as to constitute a serious hazard to not only the public water supplies of Hammond, Whiting and East Chicago, Indiana, but at times the Chicago supply obtained from the Dunne and 68th Street cribs.

The influence of wind on the travel

of pollution in the lake is strikingly illustrated by diagrams.

The industrial waste problem is largely one of emulsified oils and tarry acid wastes from refineries and steel mills.

It is unfortunate that this survey did not cover a longer period, as the year studied was one of sub-normal rainfall. It is a valuable document and should be in the library of all sanitarians.

ARTHUR E. GORMAN

A Manual of Veterinary Bacteriology—By Raymond A. Kelser. *Baltimore: Williams & Wilkins, 1927. 500 pp. Price \$5.50.*

Major Kelser has attempted to fill a need by producing a textbook dealing with the microorganisms which are pathogenic for animals. Several recent textbooks on animal pathogens have appeared in the German and French languages, but nothing new in English has appeared in recent years. The book, therefore, fills a real need in teaching bacteriology to veterinary students, and as a reference work to those engaged in work on animal diseases.

The book is divided into 11 parts which are designated as follows: 1. Bacteria, Their Morphology, Physiology and Classification, 2. Bacteriological Methods, 3. Infection and Immunity, 4. Pathogenic Organisms of the Class Schizomycetes, 5. Pathogenic Fungi, 6. The Protozoa, 7. The Filterable Viruses, 8. Serology, 9. Hematology, 10. Preparation of Veterinary Biological Products, and 11. Bacteriological Examination of Milk and Water.

The author has adopted *in toto* the classification and nomenclature of Bergey, and apparently has relied on Bergey's work in large part as a guide in compiling the list of pathogenic organisms since several errors in Bergey have been perpetuated and identical omissions of important organisms have been made. The older names of organisms are given as synonyms and these are properly in-

dexed; hence it is possible to find old friends in the book even though they are disguised under unfamiliar terms.

The subject matter of the book appears to be accurate and up-to-date. The list of organisms described is reasonably complete although such important organisms as the *Vibrio fetus*, the *Corynebacterium pyogenes* and the *Bact. viscosum-equi* are overlooked. The chapter on the Preparation of Veterinary Biological Products is unique in a book of this kind and will prove useful to many.

It appears to the reviewer that the section relating to the bacteriology of milk has been inadequately treated. Veterinary students of the present day have need of a much broader knowledge of this subject than is given.

The book should be of value to all persons who are interested in infectious diseases of animals and in those diseases of man which are transmissible from animals. It represents the most compact and accurate descriptions of the organisms of these diseases which are available in English.

W. A. HAGAN

Clinical Application of Sunlight and Artificial Radiation, Including Their Physiological and Experimental Aspects, With Special Reference to Tuberculosis—By Edgar Mayer. *Baltimore: Williams & Wilkins, 1926. 468 pp. Price, \$10.00.*

This imposing volume upon the relation of light to disease reviews the evidence to determine whether light has earned a place in the treatment of disease; surveys modern methods and applications of light, both natural and artificial; and is undoubtedly the most complete work of its nature in the English language. The book is dedicated to "Edwin R. Baldwin, M. D. of Saranac Lake, N. Y., investigator of tuberculosis, teacher, and inspiring advisor."

The subject of light as a therapeutic agent now has a voluminous literature

and a thorough review is made in the present work. The writer's personal experience has had to do especially with the use of the mercury-quartz light, but also with the carbon arc and sunlight in clinical tuberculosis at Saranac Lake. Where phases of the problem have not come within the experience of the author, the work of others has been drawn upon liberally. A study of X-ray therapy is also included.

Chapter headings and certain sub-headings appear as follows:

- I. Introduction and historical
 - II. The nature of radiation, including analysis of sources, interaction, and luminescence
 - III. Some fundamental considerations on the action of light in animal and plant life
 - IV. The action of light on growth and nutrition, including germination, phototropism, and the analysis of light action and metabolic changes
 - V. The effect of radiant energy upon bacteria and related biological products
 - VI. Physiological action of light, including radiant heat, its penetration, the phenomena of erythema; and the effects upon special organs and functions
 - VII. The skin as an organ
 - VIII. The sensitization of tissues to light
 - IX. Some experimental studies (including valuable contributions by the author upon experimental tuberculosis in lower animals, and a summary of the work of others)
 - X. The influence of climate on solar radiation
 - XI. The clinical application of solar- and arotherapy including air baths, heliotherapy, etc.
 - XII. The sources of light used in therapy, with discussion of the various forms of carbon-arc lamps, the use of the mercury-quartz and tungsten lamps and their comparison
 - XIII. Clinical studies with artificial light
 - XIV. The dosage and technic in the clinical use of artificial light
 - XV. Indications and contra-indications for irradiation, both natural and artificial, and in various forms of tuberculosis
 - XVI. The X-ray treatment of tuberculosis in various organs and parts
- Appendix — This includes special papers upon the influence of light on biological reactions, chemical reactions, photosynthesis, the action of light on carbohydrates, protein, lipoids, oxida-

tion and reduction, and ferments, and the theory of light action.

A bibliography is included consisting of some 2500 authoritative sources of information in the field. An author index lists those whose works are cited in the present book. The subject index given has been found by the reviewer to be quite complete. Repetition of statement and thought occur occasionally from chapter to chapter but in such a manner as to really add to the value of the work.

The book is profusely illustrated with graphs, diagrams, and tables, and contains 37 full-page plates, each with ample caption and legend. The work makes absorbing reading to anyone interested in the subject. Dr. Mayer has truly contributed an encyclopedic production of highest authority to the field of light therapy.

EMERY R. HAYHURST

Textbook of Bacteriology—William W. Ford, M. D. Philadelphia: Saunders, 1927. 1069 pp. Price, \$8.50.

A useful reference book but not a textbook in the sense that it can be put into the hands of students. The author has evidently spent a number of years in the collection and compilation of the material included. The book is divided into 6 parts. Part I is entitled "General Bacteriology" and deals with methods of observing and cultivating bacteria. The number of stains and media given is more than sufficient for most laboratory purposes. Part II is called "Systematic Bacteriology." This section takes up more than half of the book and is by far the most valuable portion. The classification of bacteria suggested by the Committee of the Society of American Bacteriologists of which Professor C.-E. A. Winslow was chairman is followed. No mention is made of *Bergey's Manual*. This omission will doubtless be regarded by some bacteriologists as a recommendation for Dr. Ford. The scheme of

classification as given lends itself to easy use by the student attempting to identify an organism. If Part II had been published alone, it would represent a real contribution. Parts III and IV deal with the distribution of bacteria and with infection and immunity. Much of this material is brief and inadequate and is certainly not up to date. In fact, the reviewer has failed to find a reference in the entire book later than 1924. Part V contains descriptions of the Spirochetes, and in Part VI diseases of unknown etiology are discussed.

The book is profusely illustrated with plates made under the author's direction. These are a real asset.

JOHN F. NORTON

American Illustrated Medical Dictionary—*The terms used in Medicine, Surgery, Biology, Dentistry, Pharmacy, Chemistry, Nursing, Veterinary Medicine, and kindred branches*—By W. A. Newman Dorland, M. D., Philadelphia: Saunders, 1927. (14th ed. rev.) 1388 pp. (319 ill., 107 in colors). Price, \$7.00, Thumb Index \$7.50.

In reviewing a dictionary, one is always reminded of the countryman who undertook to read one, and in commenting on it, said: "I found it very interesting, but it changed the subject too often."

It is manifestly impossible to examine every word, and one can only judge of a dictionary by looking up a number of test words.

This dictionary has gone through fourteen editions, each of which has been favorably reviewed and all of which have stood the test of time. The present edition maintains the high standard set by the author, and certain typographical errors of the preceding one have been corrected.

It is beautifully printed on light paper, and is very free from errors. A number of new words have been added, which

the rapid growth of the science of medicine and its allied branches has made necessary. On the title page the name of Dr. E. C. L. Miller, Professor of Bacteriology and Biochemistry at the Medical College of Virginia, appears as collaborator.

The work can be recommended as one of the most useful and complete of its type on the market. M. P. RAVENEL

Towards Health—By J. Arthur Thomson, M. A., LL.D., New York: Putnam, 1927. 361 pp. Price \$2.00.

One always looks forward to the appearance of a book by the author with more than usual pleasure, as there are few writers who have so much sound knowledge or who can put what they have to say in such an attractive manner.

The present volume is unlike any from this author with which we are acquainted, and we cannot help thinking that he is not at his best in this new field. His object is to explain health from the biological standpoint, and expound the fundamental principles involved. To attain this aim, he has evolved what he calls the "biological prism," "Organism, Function, Environment," which he translates into the common words, "Folk, Work, and Place."

He holds very correctly that throughout the whole of life, good health makes for good morals and good manners, and that in every period of life, health is of the utmost importance. During childhood, adolescence, maturity and aging, health must be earnestly sought, though he properly gives a warning against becoming absorbed in the pursuit of health, in season and out of season, and draws the moral that we should "covet the best gifts and health will be thrown in."

The last chapter, "Vis Medicatrix Naturae: A Summary," emphasizes nature's power and methods of cure, speaks of the small amount of disease in "Wild Nature" as compared with that seen in

man and domestic animals, the absence of senility in wild animals, and gives some explanations of the facts. Civilization and domestication, with their sheltering influences, and the balking of natural selection, are chief causative factors.

The book had its origin in a series of popular Saturday Evening Lectures, given yearly by members of the Medical Faculty of the University of Aberdeen. They are known as the Farquhar Thomson Lectures, the object of the Trust being to promote the cause of health among the people.

One can always read what Professor Thomson writes with profit and pleasure. The book is beautifully printed on light paper and well made up. M. P. RAVENEL

Dental Education in the United States and Canada—A Report to the Carnegie Foundation for the Advancement of Teaching—By William J. Gies (Bulletin No. 19). New York: The Carnegie Foundation, 1926, 692 pp. Free upon application to the Foundation.

This report maintains the high quality of the earlier bulletins on education issued by the Carnegie Foundation. It is sound, comprehensive, and thorough. The last 450 pages of the book present detailed facts concerning each of the dental schools in the United States and Canada. The first 242 pages deal with the professional, public health, and educational problems of dental education.

The author presents a fascinating story of the history of dentistry and its emergence from prehistoric customs. He pictures the early days of unscientific dentistry, the early belief of physicians and laity that the teeth were not related to health, the refusal of a medical faculty in 1839 to develop dental education under medical auspices on the ground that "the subject of dentistry was of little consequence," the development of independent dental schools and their later

elevation to the rank of other professional schools in the universities of the country. It is made apparent that dentistry is becoming more medical in both training and perspective. Yet dentistry is distinct. The dentist is not allowed to practice medicine and the physician is not allowed to work upon the teeth without a special or dental license. The author points out that the development of dentistry into the equivalent of an oral specialty of the practice of medicine requires still broader definition, scope and educational opportunity. He believes that dentistry cannot be superimposed upon a medical education because of the large number of years required in training and because of the digital facility required in dental practice and demanding extensive clinical training.

The suggestion is made that dental education should be based upon a pre-dental training of 2 years in college, that it should consist of 3 years of undergraduate professional training which would equip the student for general practice, and that an additional or a special graduate year should be offered leading to specialization. Several of the best dental schools have already gone upon essentially this basis.

The report discusses: the statutory regulations relating to dental practice; the types, number and distribution of dental practitioners; the deficiency of dental service for negroes; the regulation of dental schools by professional organizations; the curriculum, equipment and research of dental schools. The proposed general reorganization of dental education, with an improvement in the nature and quality of instruction, better clinical service and financial support, is clearly presented. Dental education in Canada is given the same type of treatment as that in the United States.

In the excellent section on General Views and Conclusions (Chapter XII)

the report summarizes from a broad, public health viewpoint: the problems of the relation of the teeth to health, the prevalence of dental disorders, the deficiencies in oral health service, the present failure in preventing dental disorders and the main requirements for the improvement of oral health service.

C. E. TURNER

Keeping Well—By Kate Platt, M. D., B. S. London: Faber & Gwyer, 1927. 246 pp. Price, \$1.25.

Among the large number of books on the general subject of health written for the lay public, there are few that we can commend more heartily than the present. It is conservative and essentially sound, emphasizing the fact that our most successful efforts will be in assisting and directing nature, rather than indulging in drastic treatments, and running after fads. We like particularly the emphasis laid on giving nature a rest in the way of holidays, which, as the author says, bring about a readjustment of mind and body and allow nature to express herself in ways which are often suppressed. The necessity of frequent short holidays, and longer ones occasionally, has been emphasized recently in this country as a means of preventing high blood pressure. Certainly the results are all to the good.

One minor criticism may be made. The author speaks of a poor complexion as being evidence that "the condition of the blood is unsatisfactory." There is little doubt that many people will construe this to mean that so-called blood purifiers must be taken, though the context shows that good feeding is the point involved. In many cases of pimples and boils there is no evidence that the blood is at fault.

The book is of convenient size and well printed on the light paper which the English are so fond of using. It is readable as well as sound. M. P. RAVENEL

The Organization and Administration of Health Education in the Secondary Schools of the United States—By Fred Lea Stetson and Frederick W. Cozens. University of Oregon Publication, Vol. 1, No. 2, Education Series, June, 1927.

This is a very useful compilation of the important facts regarding health education in secondary schools of the country, as determined by statutes and administrative measures. The legal basis, the character and extent of the supervision, and the relation of the program to physical training and other school activities are summarized; and there are recommendations pointing out the needs as indicated by the survey. There is a bibliography of some sixty titles. One is impressed by the wide range of practices in the different states and the almost universal need for a critical re-examination of what is being done for health education, as well as for a critical restatement of objectives.

B. C. GRUENBERG

Tuberculosis in Infants—By M. Alice Asserson, M. D. New York: New York Tuberculosis and Health Association. 378 pp.

This report of the Children's Service of the N. Y. Tuberculosis and Health Association deals with the incidence, significance and course of infection of tuberculosis in racial and other groups and its relation to exposure. The facts upon which the report is based were collected from the records of infants brought to the baby health stations and clinics of the association and to city hospitals. The report states that among 4,003 infants under 2 years of age in two hospitals and clinics in New York City, the incidence of tuberculous infection was 11.4 per cent. Several among these had advanced tuberculosis. Among 1,656 infants of the same age, in attendance at baby health stations where the

majority were in good health, and in clinics, among whom none had manifest tuberculosis the incidence of infection was only 3 per cent.

Troubles We Don't Talk About—
By J. F. Montague, M. D., F. A. C. S., (Ill.) Philadelphia: Lippincott, 1927. 248 pp. Price, \$2.00.

The dedication of this book describes it as well as any lengthy review could do: "These pages are dedicated to those who suffer in silence, linger in doubt and carry on in despair, so that they, too, may enjoy better health and longer life." It deals with what are generally considered minor ailments, concerning which a physician is not consulted.

We will add that the object as announced has been well carried out, and it is seldom that a reviewer has submitted to him a book which is so interesting and for which there is so little room for criticism.

We would like to call special attention to what is said about the advertisements of the producers of various sorts of foods, and the concluding statement: "Thus the billboards have become the menu card of our nation."

The book might be more fully illustrated with advantage, though such illustrations as it contains convey their meaning clearly. It is well printed on light paper with a mat surface.

M. P. RAVENEL

BOOKS RECEIVED

PARENTHOOD AND THE CHARACTER TRAINING OF CHILDREN. By Thomas Walton Galloway, Ph. D., New York: Abingdon Press, 1927. 224 pp. Price, \$1.00.

CONVALESCENCE, HISTORICAL AND PRACTICAL. By John Bryant. White Plain: Burke Foundation, 1927. 269 pp. Price \$5.00.

PULMONARY TUBERCULOSIS. (2d ed.). By David C. Muthu, M. D. New York: Wm. Wood, 1927. 381 pp. Price \$5.00.

PHYSICAL CHEMISTRY AND BIOPHYSICS FOR STUDENTS OF BIOLOGY AND MEDICINE. By Matthew Steel, Ph. D. New York: Wiley, 1928. 372 pp. Price, \$4.00.

THE RATE OF LIVING. By Raymond Pearl. New York: Knopf, 1928. 185 pp. Price, \$3.50.

TONIC HARDENING OF THE COLON. By T. Stacey Wilson. New York: Oxford, 1927. 210 pp. Price, \$2.50.

THE TEETH AND THE MOUTH. By Leroy L. Hartman. New York: Appleton, 1927. 93 pp. Price, \$1.50.

THE CHILD AND THE HOME. By B. Liber. New York: Vanguard Press, 1927. 248 pp. Price, \$.50.

THE ABILITIES OF MAN. THEIR NATURE AND MEASUREMENT. By C. Spearman. New York: Macmillan, 1927. 415 pp. Price \$4.50.

PETERSHAM'S HILL. By Grace Taber Hallock. New York: Dutton, 1927. Price, \$2.00.

THAT MIND OF YOURS. By Daniel B. Leary. Philadelphia: Lippincott, 1927. 226 pp. Price, \$1.75.

THE CURRENT SIGNIFICANCE OF THE WORD "ALUM." By William D. Richardson. Chicago: Commonwealth Press, 1927. 93 pp. Price, \$1.00.

AMERICAN RED CROSS TEXT BOOK ON FOOD AND NUTRITION. A STUDY OF THE BASIS OF FOOD SELECTION. By Ruth Wheeler in collaboration with Helen Wheeler. Philadelphia: Blakiston, 1927. 123 pp. Price, \$.60. (paper cover)

SOURCES OF INFORMATION ON PLAY AND RECREATION (rev. ed.). By Marguerita P. Williams. New York: Russell Sage Foundation, 1927. 94 pp. Price, \$1.00.

OCCUPATIONAL GROUPS AND CHILD DEVELOPMENT. By Stuart M. Stoke. Cambridge: Harvard University Press, 1927. 92 pp. Price, \$1.00.

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Philadelphia, Pa.—Accomplishments of the Philadelphia Department of Public Health from 1924 to the middle of the year 1927 are reviewed in a special issue of the monthly bulletin for November. This report is characterized by interesting text summaries of the health and hospital bureaus and by the use of good photographic and statistical illustrations of activities and results. The entire publication consists of 32 pages, size $11\frac{3}{4} \times 9$ inches, printed in good type in relation to the length of line and kind of paper used.

A threatened smallpox outbreak in the spring of 1926 stimulated general vaccination, at which time about one-half million people were thus protected. An intensive diphtheria immunization campaign was undertaken in 1924, since which time 255,604 persons have been immunized (192,555 in public and parochial schools and 63,049 in clinics, day nurseries, etc.). In the contagious disease hospital, a suction apparatus used in the treatment of patients ill of laryngeal diphtheria, seems to have given favorable results. The use of scarlet fever antitoxin has become more extensive than previously with apparently lowered death rates resulting. Convalescent measles serum, and parental whole blood have been utilized to prevent outbreaks of measles, especially in hospital populations.

School nurses during the year secured the correction of 139,750 of the physical defects (over 50 per cent of those recommended for treatment) found in pupils by school medical inspectors. Infant mortality is the lowest in the history of the city and has been cut in half during the last 15 years. Each year there is

observed a Public Health Day when health talks are delivered by prominent speakers before various clubs; exercises are conducted in schools; radio talks are given, etc. These campaigns emphasize the importance of periodic health examinations, the prevention of diphtheria, and the early diagnosis of cancer.

The report describes the organization of the medical emergency corps of Philadelphia to meet any medical emergency which may arise in or about the city. Interesting and detailed accounts of the various hospitals, including the hospital for mental diseases, conclude this record of progress.

U. S. Army—The Surgeon General's report for the fiscal year ending June 30, 1927, contains much information of interest to public health workers as well as to those directly connected with Army affairs. It is a report which abounds in carefully prepared text tables (171) and graphic figures (50). Tabular headings are complete but concise, while headings and sub-headings are effectively used in the text. A carefully prepared table of contents at the front and an alphabetical index at the back facilitate a study of this report of 501 pages.

The mean annual strength of the total Army for the year, exclusive of nurses, was 132,377. The admission rate to the sick report from all causes, and from diseases, was highest for the white troops in the Philippine Islands. The second highest rate from all causes was for the Porto Ricans in Panama. The leading causes of admission for the total Army from diseases were bronchitis, influenza, tonsillitis, and gonorrhea; and the leading causes from external causes were in-

juries resulting from athletic exercises, falls, animals (non poisonous), and automobile accidents. An annual death rate of 3.94 per 1,000 was recorded, as compared with 3.77 in 1925. The advance in the death rate from diseases was due to an epidemic of respiratory diseases during the first 4 months of the year. The leading causes of death in order of magnitude were: suicide (44), pneumonia, all forms (41), drowning (36), and tuberculosis (33).

In his letter of transmission, the Surgeon General emphasizes the need for increased personnel. "A Medical Department capable in time of peace only of rendering attendance for the sick and wounded, to the entire exclusion of major national defense objectives, is certainly not desirable. Such a contingency is probable in the near future unless more personnel is authorized."

Forsyth Dental Infirmary—The 12th annual report of the Forsyth Dental Infirmary for children contains the following significant paragraph: "In the effort to secure the prevention of tooth defects, all sources and kinds of treatment are being utilized as indicated, including ultra-violet irradiations, cod liver oil, dietary changes and stimulation in function of the endocrine glands as an aid in improving calcium metabolism. This is of course in addition to the already well established practice of early dental treatment which has given such satisfactory proof of its efficiency."

In addition to important research studies, and work with children (up to age 16), the dental prenatal clinic developed in coöperation with the Community Health Association of Boston assists in conserving the mother's teeth and in developing good teeth for the child. Children from families financially unable to obtain the service of a private dentist come to the infirmary through the public and parochial schools, social centers, institutions, physicians and dentists, and

are also brought by their parents. In 1926, 182 certificates were awarded to classes with "all dental work completed."

White Plains, N. Y.—An excellent report for a city of 28,707 people is that of White Plains. The report is printed on soft paper, in type easily read, and includes as features: a detailed appraisal, two good photographs of the department building and offices, and several charts and graphs. The lower half of the title page contains a graphic representation of the appraisal of the various functions of the department. The second page gives the department organization, while pages 3 and 4 contain a table of contents. The total score, on the basis of 1,000 points, of health practice in this city is 827. A per capita expenditure by the health department of \$.85 compares with one of \$.80 by the nursing associations, \$.56 by the Board of Education for Health, and \$1.22 by the Department of Charities for communicable disease and psychopathic cases.

During 1926, 71 per cent of the babies were born in hospitals. A birth rate of 24.6, a death rate of 11.3, and an infant mortality rate of 50 are reported.

Lowell, Mass.—The 49th annual report of the Lowell Board of Health for 1926 is bound in soft blue covers with a well arranged front cover. Introductory pages show the organization of the board and department, the expenditures for the year, and most important vital statistics. On the basis of an estimated population of 112,759, a death rate of 13.7 was recorded. An infant mortality rate of 89.6 compares with one of 83 for the previous year. Figures for the past 33 years, from 1893 up to and including 1926, "make apparent an infant mortality rate in which the number of deaths has been lessened 66 2/3 per cent."

The milk inspector's report is one of the most interesting features because of

the detailed analysis of activities and results. The per capita daily consumption amounted to 0.7 pint, 68 per cent being pasteurized. There were 81 dealers, 20 operating pasteurizing plants.

New Hampshire—The biennial report of New Hampshire for the period ending June 30, 1926, indicates increased scope of activities and greater demands for service. "The educational work which the department has carried on for years through bulletins, lectures, etc., is fast bearing fruit." Considerable effort has been directed to the safeguarding of water supplies, with favorable results. A birth rate of 20.79 and a death rate of 14.51 for the year 1925 are recorded. Four new laws enacted at the 1925 session of the legislature included: (1) bottler's licensing and registration law, (2) juvenile camp licensing law, (3) household chemicals law, and (4) law regulating the composition of embalming fluids. An account of inspection procedures of juvenile summer camps, with a list of summer camps in the state, showing address, attendance, and water supply, is one of the features of this 254 page report.

Philadelphia Schools—School health administrators will find in the 1926 report of the Division of Medical Inspection of Philadelphia (Pa.) Public Schools many interesting records of activities and results. A photograph on the title page of a school body, 97 per cent immunized against diphtheria, is at once suggestive of the preventive campaign being waged. In all, 122,000 pupils were immunized in 4 months. The personnel for the entire school health program consisted of 1 director, 12 supervisors, 97 medical inspectors, 1 head nurse, 95 nurses, and 7 clerical assistants. There were 229,054 pupils in elementary schools, with 28,678 in senior high, normal and trade schools, and 10,160 in

continuation schools. The yearly cost per pupil (not including continuation schools) of the service was \$1.16.

Routine physical examinations numbered 241,146, with 72,447 pupils being classed as physically normal. There were 270,564 defects recommended for treatment, 51.5 per cent of which were corrected during the year. The data concerning these problems are analyzed in considerable detail. Nurses made 37,709 visits to schools and 9,870 visits to pupils' homes. Nutrition and nutrition-tuberculous classes are of the open window type; in the latter group there are approximately 125 children who suffer from incipient but definite tuberculosis.

This division furnishes necessary medical service for the Bureau of Compulsory Education in connection with the issuance of employment certificates to children between the ages of 14 and 16 years. Approximately 31,183 examinations were made, and 4,126 children were refused certificates at the time of their first application. Over half of these children later secured the correction of disqualifying defects and obtained certificates. In several hundred cases there was restriction against employment of the child among power driven machinery, because of imperfect eyesight, imperfect hearing, or other good reason.

Worcester, Mass.—Graphic analyses of tuberculosis cases reported annually by wards, for 5 years, with effective representation of attendance at clinics, feature Worcester's 1926 report. During the summer, 207 children attended Sterling Health Camp, where 103 were given X-Ray examinations in addition to the routine physical. On the basis of a population of 190,757, a birth rate of 22.5 and a death rate of 14.17 are recorded. It is noteworthy that a record of the principal communicable diseases for the year is maintained by wards of the city.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Vaccination and Tetanus—Epidemiological evidence is presented which indicates that post-vaccination tetanus, when it develops, tends to follow severe primary vaccinations performed with large insertions and dressed with some type of shield or covering strapped to the site. An important contribution with which all health workers should be familiar.

ARMSTRONG, C. Tetanus Following Vaccination Against Smallpox and Its Prevention. *Pub. Health Rep.*, 42:50 (Dec. 16), 1927.

Maternal Mortality—The growth of prenatal clinics in America and the steps under way to increase the value of this service is summarized. The goal is to make this country not the most unsafe, but the safest for women during the period of childbirth.

BAKER, S. J. Maternal Mortality in the United States. *J. A. M. A.*, 89:24 (Dec. 10), 1927.

Goiter and Scholarship—Data are presented to show that students with normal thyroids more frequently attain high scholastic standing than do goitrous persons.

BEARD, J. H. Endemic Goiter and Scholastic Standing. *Nation's Health*, 1:12 (Dec.), 1927.

British and American Longevity—The expectation of life of males was about the same in both America and Great Britain in 1921 (being 55.5+); whereas, for women the expectation was 59.5 in England 57.7 in the United States.

BRITTAIN, R. H. Expectation of Life in England and in the United States. *Pub. Health Rep.*, 42:48 (Dec. 8), 1927.

Measles Epidemiology—An interesting paper emphasizing the importance of nursing and hygiene in preventing

measles mortality, and the predictability of measles outbreaks. Rational preventive measures are outlined and urged.

GODFREY, E. S. Epidemiology of Measles. *Nation's Health*, 9:12 (Dec.), 1927.

Cannery Supervision—A symposium by British health authorities on the supervision of meat, fish, fruit, and vegetable packing, and the sanitary inspection of canned products.

GRANT, R., et al. Canned Meat-Preparation and Inspection, etc. *J. Roy. San. Inst.*, 47:6 (Dec.), 1927.

Antirachitic Factor in Milk—Cow's milk produced under ideal conditions contains negligible amounts of the antirachitic factor—even human milk does not protect against rickets. A technical dissertation concluding that fish oils, egg yolk, and liver are the most available sources.

HESS, A. F., and WEINSTOCK, M. A Study of the Antirachitic Factor in Human Milk and in Cow's Milk. *J. Dis. Child.*, 34:5 (Nov.), 1927.

Vaccine Virus As An Antigen—Studies confirming the statement that animals may be immunized by injections of killed vaccine virus, and passively immunized by immune serum.

HUNT, L. W., and FALK, I. S. Some experiments on the Antigenic Properties, Filterability and Microscopy of Vaccine Virus. *J. Immunol.*, 14:6 (Dec.), 1927.

University Student Health—An address on the health influence of colleges, covering student health conservation, education regarding individual and community health, the training of sanitarians, and the promotion of research.

KERR, J. W. The University in Relation to the Public Health. *Pub. Health Rep.*, 42:47 (Nov. 25), 1927.

Heredity and Rheumatism—An attempt to marshal the evidence in favor of the hereditary influences of rheumatic fever. Interesting mental gymnastics, the practical value of which is none too apparent, for the author does not suggest the remedies if his contention were true.

JONES, A. B. The Hereditary Factor in Acute Rheumatism. *J. State Med.*, 35:12 (Dec.), 1927.

European Supervision of Midwifery—The saving of maternal and infant life through rationally supervised midwifery in Europe is offered as an example of what might be done in those states of our own enlightened country which do nothing to improve conditions among their midwives. Another story to jar our complacency.

KOSMAK, G. W. Results of Supervised Midwife Practice in Certain European Countries. *J. A. M. A.*, 89:24 (Dec. 10), 1927.

Teaching Hygiene—A description of the methods used in teaching practical hygiene in the Newton (Mass.) schools. The children suggest health topics, choose their order of presentation and develop courses with little aid from their teachers.

LATIMER, I., and SIMON, C. Teaching Hygiene to Grammar and High School Pupils. *Nation's Health*, 9:12 (Dec.), 1927.

Needs of County Health Units—Adequately trained health officers and subordinate officials are the most pressing needs in the extension of the county health unit program.

LAUGHINGHOUSE, C. O'H. County Health Work. *J. A. M. A.*, 89:26 (Dec. 24), 1927.

Milk Consumption—An average per capita milk consumption of 0.48 quarts in Massachusetts during 1923 indicates that the ordinary estimates of milk consumption are too high.

McFALL, R. J. Per Capita Milk Consumption in Massachusetts. *Nation's Health*, 9:12 (Dec.), 1927.

British Milk Supervision—This illuminating account of the formalities and red tape demanded by British law when grossly contaminated milk is received will cause American sanitarians to thank their lucky stars that more direct and effectual powers are granted by our health laws.

LLOYD, J. S. Tuberculous Infection in Milk as Affected by Recent Legislation. *J. Roy. San. Inst.*, 47:6 (Dec.), 1927.

"Normal" Growth and Diet—Records are presented to indicate that rats may be made to grow at a greater rate than that regarded as "normal," and that the "curve of repair" scarcely surpasses the true normal growth upon appropriate diet.

MENDEL, L. B., and CANNON, H. C. The Relation of the Rate of Growth to Diet. *J. Biol. Chem.*, 75:3 (Dec.), 1927.

Dietary Deficiencies—Studies are presented which lead to the conclusion that foodstuffs carrying vitamins A and B contain other growth promoting substances than the generally accepted water-and fat-soluble groups, without which optimum growth is not attained.

PALMER, L. S., and KENNEDY, C. The Fundamental Food Requirements for the Growth of the Rat. *J. Biol. Chem.*, 75:3 (Dec.), 1927.

Infant Diets—An interesting diet table for children of from 6-13 months is presented. It provides, first, the fats, then the roughage and vitamins needed to establish correct alimentary functions.

PRITCHARD, E. Preventive Treatment of Digestive Troubles in Young Children. *Lancet*, 2:26 (Dec. 24), 1927.

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REITH, A. F. Streptococci As a Cause of

Spontaneous Abortion. *J. Infect. Dis.*, 41:6 (Dec.), 1927.

Scarlet and Diphtheria Mixed Infections—Of 100 diphtheria patients, 29 gave cultures of hemolytic streptococci from nose or throat. Of these, 16 were shown to be scarlatinal. It is possible that some were scarlet fever cases in diphtheria carriers. Results indicate the advisability of individual isolation.

RHODES, PAUL F. The Incidence of Scarlet Fever Streptococci in Throats of Diphtheria Patients. *J. Infect. Dis.*, 41:5 (Nov.), 1927.

A City Cardiac Survey—Of the 120,000 school children in Boston, 2311 heart cases were picked up in the routine school child examinations. The majority (1,344) were found to have no significant disease; 265 were classed as doubtful, requiring reexaminations; the remainder required special treatment.

ROBEY, W. H. A Cardiac Survey of Children in Boston Public Schools. *Nation's Health*, 9:12 (Dec.), 1927.

Exercise for Cardiacs—A paper emphasizing the importance of supervised, graduated exercise after recovery from heart infections; assuming that the attack has come to a close only when the temperature has not risen above 99.60° F. for ten consecutive days.

ST. LAWRENCE, WILLIAM. The Problem of Exercise for Children with Heart Disease. *J. A. M. A.*, 89:27 (Dec. 31), 1927.

School Sanitary Survey by Laymen—The Kentucky Rotary was called in to conduct a survey of the rural schools. An inspection blank was furnished and instructions printed. A fol-

low-up to improve the insanitary conditions found is now in progress.

THOMAS, A. A. Kentucky Rural School Survey on Health and Sanitation. *Nation's Health*, 9:12 (Dec.), 1927.

Antirachitic Effect of Sunshine—A series of important papers measuring the antirachitic effect of direct sunlight at various seasons; the effect of skyshine (indirect sunlight); and sun's rays through the special window glasses. Too inclusive for summarization here.

TISDAL, F. F., and BROWN, A. Seasonal Variation of Effect of Sunshine (and other papers). *J. Dis. Child.*, 34:5 (Nov.), 1927.

Endemic Goiter Prophylaxis—The endemic goiter occurring in an urban district in England in which there is little possibility of iodine deficiency cannot be attributed to that cause. Iodine prophylaxis hence cannot be recommended. The author suggests vitamin deficiency as a possible cause, and emphasizes the spontaneous recovery in many cases.

TURTON, P. H. J. Prophylaxis and Treatment of Childhood Goiter. *Lancet*, 2:23 (Dec. 3), 1927.

Undigested Proteins—That a proportion of the protein intake may be absorbed undigested under certain conditions has long been a commonly accepted fact. Here is offered immunologic evidence to prove it. Of interest to health officials dealing with anaphylactic and dietary problems.

WALZER, M. Studies in Absorption of Undigested Proteins in Human Beings. *J. Immunol.*, 14:3 (Sept.), 1927.

NEWS FROM THE FIELD

WARNING AGAINST VACCINATION SHIELDS

FROM the U. S. Public Health Service again comes the warning against the use of any sort of shield or dressing applied to a vaccination spot. It is emphasized that shields or dressings applied to a vaccination often are a cause of severe "takes" and delay healing.

DR. STREETER AWARDED KIWANIS MEDAL

HOWARD R. Streeter, M.D., Fellow A. P. H. A., Health Officer of Manchester, N. H., was recently awarded the Kiwanis Medal for distinguished service to the Community of Manchester. The Kiwanis Medal is given annually to the person or organization that has rendered the greatest service to the community during the year. A marked decrease in contagious disease since 1921 when Dr. Streeter became Health Officer of Manchester was cited among his several public health achievements.

HEALTH SERVICE OFFERED BY CONNECTICUT STATE DEPARTMENT OF HEALTH

THE Connecticut State Department of Health, Bureau of Public Health Instruction, offers a service of films, slides, posters, and health leaflets dealing with several public health topics. The pamphlet *Health Service* lists 42 motion picture films with a brief description of each film. A list of health slides and posters available is also included. This pamphlet is one of the most valuable for the health worker's reference shelf of aids in health education.

A GOVERNOR SPEAKS FOR PUBLIC HEALTH

THE value of public health work was emphasized by Governor Alfred E. Smith of New York in his annual message to the State Legislature. Governor Smith pointed out some of the achieve-

ments of the public health program in the past 10 years and emphatically stated:

Proper attention to the preservation of the public health will produce a strong, healthy, vigorous people. There is no greater state asset.

Governor Smith surveyed the development of the state's public health activities, including the state and local laboratory service, state aid to rural communities, public health education and supervision of water supplies in several municipalities, and supervision of oyster beds on Long Island.

He referred to the amendments to the Medical Practice Act of 1926, the maternal and infant health program carried out, and the school health and nursing programs. He said:

It must be borne in mind that for thoroughly effective health work, the state must have the full coöperation of the localities. The counties should do their share. The state stands ready to give financial and other aid, but unless there is a live, local interest in the public health problem, the desired progress is difficult to make.

TRAILING A FAKE EYE SURGEON

HEALTH authorities throughout New York State are on the trail of a fake eye surgeon, one Simon Mohr, who has been extracting large sums for his services. For his operations he has selected villages and rural communities. The publicity given to his practices attracted considerable attention. One of the last reports made to the New York State Department of Health is that he rendered services in a family in North Rose, Wayne Co., but only charged \$400, a fee much smaller than he had demanded some weeks previous in Orange County.

Commissioner of Health, Dr. Matthias Nicoll, Jr., put the Superintendent of State Police on the search for "Dr."

Mohr, and a warrant for his arrest has been sworn out.

CHICAGO CITY COUNCIL COMMENDS DR. BUNDESEN

AT the regular meeting of the City Council of Chicago, Wednesday, December 14, a resolution was presented expressing appreciation of the services of Herman N. Bundesen, M.D., former Commissioner of Health of Chicago.

It was unanimously voted that the resolution become a part of the public record of the Council proceedings, and that a copy be suitably engrossed and presented to Dr. Bundesen as a token of the esteem and affection in which he was held by the Council members.

The outstanding achievements of Dr. Bundesen's 6 years' administration are cited. He is credited with markedly improving the health of the community through the efficient management of the health department, through new methods of health education, the promulgation of sound policies and rulings, establishment of higher standards of living, advancement of sanitation and more intensive disease control.

The resolution also pointed out that the death rate dropped from 13.71 per 1,000 population during the previous 7 years to an average rate of 11.5 per 1,000, "establishing thereby an unequalled record among all large cities of the nation."

Dr. Bundesen's fight for a pure milk supply, his campaign for the education of mothers in the care and feeding of infants, the establishment of infant welfare stations, and distribution of special health publications—all of which aided in reducing the death rate of Chicago babies under 1 year of age from 89.3 per 1,000 births in 1921 to 63.8 per 1,000 births in 1927—were recorded in the appreciation of his services.

The resolution stated that Dr. Bundesen had developed a department of

health whose efficiency has attracted and stimulated the interest in programs of other cities, and one of the greatest recognitions of his ability was his election to the presidency of the American Public Health Association. The Council commended him as an example and inspiration to "health officials the world over."

It concluded:

RESOLVED, that we, the members of the City Council of the City of Chicago, do hereby convey to Dr. Herman N. Bundesen our personal and official appreciation and that of the people of the City of Chicago for the great and valued service the benefit of which no one can overestimate, and that we hereby express the hope that in life's pursuits he will find even greater opportunity to devote his ability and experience to the interest of health, happiness and public well being.

DIPHTHERIA IN MANCHESTER, N. H.

THE first mention of diphtheria in the health department reports was in 1885 when 18 deaths were recorded. The following year, 1886, 9 deaths from the disease were reported; in 1887, 73 cases and 17 deaths were recorded. Since 1887, diphtheria has been reported regularly, and both number of cases and rate have been high, in fact, above the general average of cities of like size. The total number of cases of diphtheria and number of deaths have exceeded the cases and deaths from scarlet fever. The highest number of cases reported in any year was 492 in 1908 and in the same year the highest number of deaths, 41, was recorded; the lowest number of cases was recorded in 1899—but in that same year 9 deaths were recorded and, thus, the number of cases reported is manifestly wrong; the lowest number of deaths, 1, was recorded in 1893. The disease has always increased in incidence soon after schools opened in the fall; the ages of greatest incidence have been 6 and 7; four-fifths of the cases have occurred under 15 years of age. November 1, 1921, control measures,

comprising Schick testing, toxin-antitoxin treatment, antitoxin immunization of immediate contacts, culturing for carriers, quarantining carriers until cured, were instituted. The results were immediate and striking. The incidence both in morbidity and mortality has declined from 469 cases with 31 deaths in 1921, to 9 cases with 2 deaths in 1927. The diagnosis of 1 fatal case in 1927 was in doubt but the cause of death was given as diphtheria and was so recorded.

More than half the school population has been immunized or is Schick negative.

The following table gives the incidence for the past 7 years:

Year	DIPHTHERIA		
	Rate per 100,000		
	Cases	Pop.	Deaths
1921	469	585	31
1922	254	317	27
1923	188	230	15
1924	81	99	6
1925	31	37	6
1926	12	14	3
1927	9	10	2

NATIONAL COST OF BLINDNESS

THERE are 100,000 blind persons in this country. The preventable causes of blindness have cost this country more than \$100,000,000 in the last 10 years, according to a statement given out by the National Society for the Prevention of Blindness. It is not costing more than \$100,000 a year to carry on the work of preventing blindness and conserving vision generally in the United States. Industrial accidents alone cost the industries of the country nearly \$10,000,000 every year and are responsible for 15 per cent of our blind population.

The society is directing its efforts against all causes of blindness including ophthalmia neonatorum, trachoma, venereal diseases, industrial eye hazards and accident hazards in public and home life.

FUND TO FIGHT COMMON COLD

A 5-year war against the common cold will be directed by Johns Hopkins University and the Johns Hopkins Hospital, and financed by the Chemical Foundation of New York. A fund of \$195,000 to be known as "The John J. Abel Fund for Research on the Common Cold" has been established with a promise that more funds will be raised if needed to continue the research. The research will be conducted on a coöperative basis involving the staff and facilities of every department in the Medical School, the School of Hygiene and Public Health and the University Hospital.

Dr. Abel is professor of pharmacology at Johns Hopkins University, and conducted the researches that led to the discovery and synthetic production of adrenalin. He was the first to isolate the pure chemical principle of insulin.

GOITER SURVEY IN TENNESSEE

A SURVEY of goiter incidence will be made in Tennessee beginning April 2 under the direction of Dr. Robert Oleson of the U. S. Public Health Service. Dr. Oleson is one of the leading authorities on goiter.

School examinations by the Division of Child Hygiene in different parts of the state have shown a considerable variation of incidence of goiter in different sections. Tennessee hopes to determine by Dr. Oleson's survey if it has a goiter problem of sufficient extent and importance to require additional attention of public health officials.

RURAL HEALTH DEMONSTRATION CONTINUED

TO raise the health standards of rural communities and reduce mortality rates throughout the country as the result of its public health experiment in Cattaraugus County, N. Y., directors of the Milbank Memorial Fund have appro-

appropriated \$87,000 for the continuance of the demonstration program in Cattaraugus County. The demonstration program was originally planned for 5 years. This additional appropriation will provide for another year of work. The total grant for the demonstration program has been \$500,000. The Cattaraugus County Governing Board has within the 5-year period appropriated \$113,000 and the State of New York has contributed appropriations totalling \$95,000.

The demonstration is being continued at the specific request of Cattaraugus County health authorities, despite the opposition from a small group in the local medical society.

The conspicuous achievements in Cattaraugus County during the 5-year demonstration period has been a reduction of about one-third in the tuberculosis death rate, and nearly one-fifth in the infant mortality rate. More than 50 per cent of the 150,380 physical defects of the rural school children found by medical examiners have been corrected. Approximately 50 per cent of the children of the county under the age of 10 have been immunized against diphtheria. There has also been a marked reduction in bovine tuberculosis as a result of the program carried out by the demonstration directors in coöperation with specialists and federal and state officials.

DR. PLATT APPOINTED TO NEW POSITION

PHILIP S. Platt, Ph.D., Secretary of the Associated Out-Patient Clinics Committee, New York Tuberculosis and Health Association, has been appointed Assistant Director of that association. Dr. Platt will continue as Secretary of the A. O. P. C., and will also have direct supervision of the Committee on Community Dental Service and the Tuberculosis Committee of the association.

Dr. Platt is a Fellow of the A. P. H. A. and is Chairman of the Public Health Education Section of this Association.

CALIFORNIA

SIR ARTHUR Newsholme, M.D., K.C.B., former chief medical officer of the Local Governing Board of England and Wales, who is spending the winter at Santa Barbara, Calif., was guest of honor at a banquet given by the Southern California Public Health Association at Los Angeles, January 13. About 200 members and their guests were present.

Sir Arthur was introduced by Dr. J. L. Pomeroy, President of the Association. Sir Godfrey Fisher, British Consul, extended the welcome. Sir Arthur spoke briefly, touching upon constructive public health policies.

Sir Arthur Newsholme was instrumental in the forming of the British Ministry of Health, correlating all public health functions under one department and eliminating the confusion arising from many different bureaus acting for the government. He was lecturer on public health administration at the school of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md., 1917-1919.

MASSACHUSETTS

THE 1928 annual meeting of the Massachusetts Association of Boards of Health was held in Boston, January 26, at Hotel Bellevue.

The responsibility for the care and treatment of tuberculosis by the Commonwealth and by the town, city and county with the attendant difficulties of settlement, subsidy, and responsibility is a subject of much concern to those entrusted with this work, besides being confusing as to charges and cost. Therefore three aspects of the problem of tuberculosis were presented at this meeting:

"Present Resources for Handling Tuberculosis in Massachusetts," George H. Bigelow, M.D., Commissioner of Public Health of Massachusetts

"Local Care and Responsibility of Tuberculosis," George T. O'Donnell, M.D., Director,

Division of Tuberculosis, Boston Health Department

"Settlement Laws and their Application to Tuberculosis," William H. Hardy, formerly secretary, Department of Public Welfare, City of Boston

The 1927 officers were reelected, namely: President—John J. McGrath, Salem; 1st Vice-Pres.—M. Victor Safford, M.D., Boston; 2nd Vice-Pres.—J. U. Paquin, M.D., New Bedford; Secretary—Stephen L. Maloney, Boston; and Treasurer—F. G. Curtis, M.D., Newton.

Executive Committee: George R. Lennon, Haverhill; Lyman A. Jones, M.D., Norfolk; E. H. Trowbridge, M.D., Worcester; J. H. Glennon, M.D., New Bedford; and Jacob R. Sackett, Springfield.

MICHIGAN

OVER 300 sanitarians attended the seventh annual public health conference conducted by the Michigan Public Health Association, an Affiliated Society of the A. P. H. A. and the Michigan Department of Health. This meeting, held at Lansing, January 11, 12 and 13, 1928 was better attended than any of the six preceding ones.

The officers of the Michigan Public Health Association elected for 1928 are: President, John Sundwall, M. D., University of Michigan; Vice-President, Prof. Ellis J. Walker, Western State Teachers College; Secretary-Treasurer, W. J. V. Deacon, M. D., Bureau of Records, State Dept. of Health, Lansing, Mich.; Representative to the A. P. H. A., Guy L. Kiefer, M. D., State Health Commissioner, Lansing, Mich.

Board: T. W. Worley, Michigan Tuberculosis Association; Grace Ross, R. N., Dir. Nursing Division, Dept. of Health, Detroit, Mich.; R. C. Mahoney, Chairman, Public Health Committee, Michigan State Medical Society; Don Griswold, M. D., Deputy Health Commissioner, Michigan State Board of Health; and William G. Stapleton, M. D., Wayne Co. Medical Society.

SOUTHERN CALIFORNIA

THE Pomona Health Center, erected by Los Angeles County at a cost of \$68,000 on property given by the city of Pomona, recently opened its doors for

service to the public. The new building said to be one of the best equipped health centers in the country has been erected adjacent to the other municipal buildings in the civic center. Every phase of public health service will be housed in this building.

The health center was opened with a formal program attended by Los Angeles County and Pomona city and health officials and representatives of the medical profession.

J. L. Pomeroy, M. D., county health officer and head of the department under which the center functions, visited the health centers of several eastern cities, and is convinced that in the Pomona institution has been incorporated the most extensive public health service of any centers visited.

The Pomona Health Center is the third of such institutions being built by the Los Angeles County Health Department. Health centers are also to be erected at Santa Monica and Belvedere.

TENNESSEE

S. S. Moody, M.D., formerly Health Officer of Weakley County, has accepted the position of Health Officer of Washington County in East Tennessee. Dr. M. D. Ingram, of Gibson County has been recommended to fill the vacancy as Health Officer Weakley County, which is left vacant by Dr. Moody.

Wilson County will have a full-time health department. This is the result of a unanimous vote of the Wilson County Medical Society. Tennessee now has 17 full-time health departments, with 3 counties in addition that have the county sanitary officer plan of work.

VIRGINIA

AT the annual meeting of the Virginia Public Health Association, an affiliated Society of the A. P. H. A., at Suffolk, Va., January 4-5 the following officers were elected: President, C. P. Ransom, M. D.; Vice President, C. H. Dorsum; Secretary-Treasurer and A. P. H. A. Representative, P. S. Schenck, M. D.

PERSONALS

William F. Wild, M.D., has been appointed Health Officer of Bridgeport, Conn., assuming his duties February 1. Dr. Wild resigned his position with the Division of Public Relations of the American Child Health Association to accept the Bridgeport appointment. He was formerly field representative for the American Society for the Control of Cancer, executive secretary of the Minnesota Public Health Association at St. Paul, and also served as director of laboratories and epidemiologist and later health commissioner of the State of Nebraska. Dr. Wild received his medical training at the Tulane Medical School, Tulane, La., and his public health training at Harvard University and the Massachusetts Institute of Technology.

Bernard S. Coleman has been appointed executive secretary of the Hudson County Tuberculosis League, Jersey City, N. J.

George Bevier, M.D., formerly field director of International Health Board, New York, N. Y., is now at Bogota, Columbia, S. A.

W. W. DeBerard, formerly chief engineer of the Chicago Regional and Planning Association is now associate editor of the *Engineering News-Record*, with headquarters in Chicago.

William L. Holt, M.D., formerly of Portland, Me., has become affiliated with the Medical Department of the Ciba Co., pharmaceutical branch, with headquarters in New York, N. Y.

Charles C. Evans, formerly teacher of physiology and Hygiene at Stevens Point, Wis., is at Chicago University doing research work in public health.

Dr. Ethel R. Harrington has been ap-

pointed to the staff of the Division of Child Hygiene and Public Health Nursing of the Illinois State Health Department.

Dr. A. W. Haskell, Associate Milk Specialist of the U. S. Public Health Service has been detailed for one year to the Tennessee State Health Department. Dr. Haskell will conduct field investigations in milk control work throughout the state, coöperating with the Tennessee State Health Department.

W. D. Riley, Regional Consultant for the U. S. Public Health Service, has been assigned to the Tennessee State Health Department for a study of venereal disease prevalence in the state.

Harry Bruce Wilson, superintendent of schools, Berkeley, Calif., has been appointed National Director of the American Junior Red Cross. Mr. Wilson will assume his duties February 1. He succeeds the late Arthur W. Dunn who was director of the organization for six years.

Felix M. Massey, Dean of Men, University of Tennessee, Knoxville, Tenn., has been appointed as a specialist in the Land-Grant College Survey being conducted by the U. S. Bureau of Education. Dean Massey's duties will include the preparation of a questionnaire dealing, among other things, with the health services for students and their regulations, and the housing and feeding of students in the colleges.

Edward Bausch, president of the Bausch and Lomb Optical Co., Rochester, N. Y., has been elected an honorary member of the American Microscopical Society "in recognition of more than 50 years of active interest in microscopy."

Dr. Thaddeus P. Hyatt has been ap-

pointed Supervising Dentist of the New York City Department of Health. His services are lent by the Metropolitan Life Insurance Co., where he is director of dental education, to supervise the extension of the department's work among school children which now has a staff of 19 dentists and 25 dental hygienists.

Ira V. Hiscock, Assistant Professor of Public Health, School of Medicine, Yale University, Fellow, A. P. H. A., has been appointed a member of the Board of Health of New Haven, Conn., for 5 years, beginning February 1. The appointment was made by Mayor John B. Tower of New Haven.

Charles E. Miner, formerly executive secretary of the Missouri Social Hygiene Association, St. Louis, Mo., has gone to Chicago to become Superintendent of the Committee of Fifteen. The purpose of the committee is "to aid the public authorities in the enforcement of laws against pandering and to take measures calculated to prevent traffic in women."

Mrs. Frances W. Everberg of Woburn, Mass., has been appointed chairman of the Woburn Municipal Board of Health. Mrs. Everberg is a graduate of the Massachusetts General Hospital Training School for Nurses and during the war served with the Massachusetts General Hospital Unit No. 6.

Dr. Warren E. Danley has been appointed health officer of Union City, Mich. to succeed Dr. Ernest E. Hancock.

Dr. Henry L. Burdeno has been appointed health officer of Dearborn, Mich.

Gerald Wendt, Ph.D., dean of the school of chemistry and physics, and director of the division of industrial research, Pennsylvania State College has resigned, effective in July, to become director of the Battelle Memorial Institute for scientific and industrial research, Columbus, O., which has recently been founded.

Dr. Henry Hanson has been appointed field officer for the Florida State Board of Health with headquarters at DeFuniak Springs. For several years Dr. Hanson has been engaged in the study of yellow fever in Africa.

Dr. Herman N. Bundesen has been appointed Health Director of the Chicago Sanitary District and also Health Editor of the *Chicago Daily News*.

Beginning January 1, 1928, Dr. J. C. Geiger was granted leave of absence for one year by Dr. Kegel, the new Health Commissioner of Chicago.

Dr. I. S. Falk has announced his resignation as Director of Surveys and Exhibits of the Chicago Health Department.

Arthur E. Gorman, in charge of the safety of Chicago's water supply with the Division of Engineering, has been suspended by request of the Health Commissioner. Mr. Gorman has been appointed Epidemiologist of the Chicago Sanitary District.

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American Journal of Public Health

and THE NATION'S HEALTH VOL. X NO. 3

Volume XVIII

March, 1928

Number 3

Medico-Legal Aspects of Occupational Disease*

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and

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WHEN the compensation laws of the various states were first enacted, occupational diseases were given no place. The benefits were confined to industrial accidents and their sequelae. Though the word "accident" was interpreted strictly in the beginning, this interpretation was soon given a liberal construction and the word "accident" was in many cases changed to "injury" to facilitate the inclusion of conditions obviously not accidental. Infections such as anthrax, typhoid fever, acute cases of poisoning such as lead and metal fume fever thus became compensable before the definite inclusion of occupational disease in the compensation acts.

The same consideration that prompted the move for compensation for industrial accidents—the severe economic and social distress of injured workers—prompted the gradual inclusion of occupational diseases into this scheme of relief. It seemed only fair and just that industry take the burden from the shoulders of the worker who was engaged in employment that was sure to shorten his life and expose him to hazards that would disable him physically and economically.

This necessity for allowing compensation in cases of occupational disease has been recognized by several of the states, so that at the present time the federal government and 12 states, including Hawaii and Porto Rico, include occupational diseases in their compensation

* Read before the Industrial Hygiene Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 20, 1927.

laws. This inclusion is accomplished in three ways: by the word "injury" denoting accident and occupational disease; by the court's interpretation of the word accident; and by the enumeration of a specific list of occupational diseases. Minnesota, New Jersey, New York, North Dakota, Ohio and Porto Rico all have special lists, the diseases to be compensated for being specifically stated. Some of the states not only specify the disease, but also the restricted processes in which it must be acquired in order to be compensated.

With the inclusion of occupational disease in the compensation laws of these states, compensation boards and commissions now have the added problems of arbitration and administration of awards for occupational affections. The arbitration of such awards may be easy or difficult, depending on the wording of the act as well as its scope. Where the act specifies a list of 10 diseases, as in New Jersey, the work is more or less simplified. Where the whole gamut of human illness is thrown open to an occupational etiology, as in California and Connecticut, the difficulty of adjudication becomes great. It would seem more practical and equitable to accord pecuniary benefits in the latter case through a system of workmen's sickness insurance.

New Jersey in 1924 amended its compensation act to include occupational disease. It now has 10 such diseases listed:

- | | |
|---------------|------------------------------------|
| 1. Anthrax | 6. Chrome |
| 2. Arsenic | 7. Wood alcohol |
| 3. Lead | 8. Benzene and its homologues |
| 4. Mercury | 9. Caisson disease |
| 5. Phosphorus | 10. Mesothorium or radium necrosis |

This constitutes 1 infection (anthrax), 1 affection due to compressed air (caisson disease) and 8 poisons. Prior to the inclusion of the list, anthrax had already been construed as compensable while many of the poisons were compensated for their effects in cases of sudden exposure due to accidental leaks in piping or unavoidable accidents in technical processes. New Jersey does not prescribe the process in which the disease must be contracted, thus liberalizing the construction of the act considerably.

Those who appreciated the important rôle played by the compensation law for accidents in the increased reporting of accidents felt a justifiable expectation in the increased reporting of occupational disease. This, fortunately, has been realized. It is our impression after eight years of service that three times as many claims for occupational disease have been filed since its inclusion. However, the number of cases reported is still insufficient. This lack of increased reporting can be explained: First, the law is only three years old; second, occupational

disease is for the most part insidious and does not make the strong impression that accidents do; third, the medical profession is still far behind in the detection or appreciation of occupation as an etiological factor in the causation of disease.

Occupational disease in New Jersey is reportable to the State Board of Health by the doctor in a similar manner to the reporting of communicable disease. There is, however, no special form, nor is reporting compulsory. The State Department of Labor receives a copy of each report submitted and upon its receipt makes a complete investigation. Occupational disease is reportable also to the State Department of Labor by the employer on the same blanks as accidents are reported. Every claim for compensation in occupational disease is investigated by the factory inspectors of the Department of Labor.

In Ohio where excellent work has been done in the matter of legislation for the proper reporting of occupational disease, more than 4,500 cases of occupational disease of all types were reported between the years 1921 and 1925. Yet, this number is far below the actual incidence of occupational conditions.

Dr. Wade Wright found 2,000 occupational disorders out of 32,000 patients in the out-patient department of the Massachusetts General Hospital, an incidence of 6 per cent, of which in one year 148 cases of lead poisoning were found.

The improvement of occupational disease reporting depends on the combination and coöperation of several agencies: First, the compulsory reporting by physicians on special forms to the state department of health; second, the compulsory reporting of employers to the state department of labor; and third, the establishment of an occupational disease clinic under state auspices for the actual demonstration of the examination of workers and the detection of occupational disease conditions, as well as serving as a clearing house for information to the physician, employer and employe. Such a clinic has been proposed in New Jersey, and the first will be opened at Newark.

In the three years since occupational diseases have been compensated for in New Jersey, 1210 claims have been filed, of which 420 have been held non-compensable. Of the 790 compensable claims, 265 were for lead poisoning, 110 for benzol poisoning, 114 for mercury poisoning and 241 were for occupational dermatoses. The rest were scattered among the remaining compensable diseases with the exception of phosphorus poisoning, no such case being filed for claim.

The responsibility for the arbitration of awards of compensation for occupational disease rests for the most part upon the medical adviser. The referee and commissioner look to him for a correct and

intelligent solution of the various problems they must meet. They need answers to the following questions:

1. Is this man suffering from a compensable illness?
2. Was it acquired or aggravated at the last place of employment?
3. Does he require further treatment, or, is he able to work?
4. Has he suffered any permanent vital changes which will affect his future earning and working capacity?
5. If he dies—was the death the result of a specific occupational disease?

The task of the arbitrator or medical examiner is therefore fivefold. He must do the following:

1. Make a diagnosis
2. Determine the responsibility for the occupational disease if it exists
3. Decide the temporary period of disability
4. Determine the permanent disability
5. Determine the cause of death

DIAGNOSIS

Our first problem is that of differential diagnosis. For example, in lead poisoning the symptoms must be differentiated from those of other affections. We must distinguish lead colic from the gastric crises of tabes and syphilis, lead encephalopathy from epidemic encephalitis, lead arthritis from other infectious arthritides and lead anemia from the anemia of malignancy.

Where these symptoms stand alone without other clinical or laboratory support, the diagnosis is uncertain. Colic occurring in a worker exposed to lead is not considered compensable unless accompanied by other objective clinical findings such as radial extensor weakness, lead line or by laboratory evidence of basophilic degeneration of red blood cells. In this respect, the use of the Martin spring balance to detect minor reductions in the strength of the radial extensors has been found very helpful. Such a finding is considered sufficient corroboration to justify a diagnosis of compensable lead poisoning. The question of differentiating between lead absorption and lead intoxication does not ordinarily concern us since most of the claimants appear because of some subjective or objective symptom related to intoxication. However, the detection of lead poisoning in workers without symptoms, but with definite lead line or laboratory evidence of the disease, such as may be disclosed at the periodical examination which is compulsory under our law for lead workers, automatically entitles them to the benefits of compensation. The following cases are illustrative of the problem of diagnosis:

A claimant aged 65 had worked in a lead smelter for 15 years and had been exposed to lead fumes and dust. His chief complaint was a constant tremor of both hands and a slight incoordination in walking. On examination, he disclosed

a typical syndrome of Parkinson's disease with masklike facies and tremor of hands and legs, propulsive gait, monotonous speech and loss of associated movements. His blood showed no changes except for a Hb of 80 per cent and a red cell count of 4,400,000. His claim was disallowed.

A negro aged 32 had worked for 2 years in the grinding room of a paint factory when he ceased to work on account of severe cramp-like abdominal pain. He alleged lead poisoning and filed a claim for compensation. He was found to have no other clinical or laboratory evidence of lead poisoning but he did have a positive Wassermann. His symptoms cleared up rapidly under mixed treatment. No compensation was allowed.

Workers on lead storage batteries are aware of the lead hazard and often file claims without any definite clinical symptom or complaint except for occasional malaise or giddiness. It is surprising to find marked stippling and a severe anemia present in these cases without more clinical symptoms. Examination of the urine and feces however reveals large excretion which explains the mildness of their symptoms.

A paster in a lead storage battery plant had worked at his last place of employment for 8 months and had been free from symptoms. He was seized one day with cramps and placed himself under treatment by a physician. He filed a claim for compensation and was examined. His blood was apparently normal, Hb 90 per cent, red count 5,200,000. His only symptom was colic. His urine showed definite lead excretion. He was allowed compensation. In many cases the evidence may be only presumptive, but the benefit of the doubt must be given the worker.

We have established three postulates each case should satisfy in order to meet the medico-legal test of compensable occupational disease:

1. The patient must demonstrate an exposure to the occupational poison.
2. He must demonstrate absorption of the poison by clinical or laboratory signs.
3. He must demonstrate clinical evidence of disability from this poison.

RESPONSIBILITY OF EMPLOYER

Having made our diagnosis, our next problem is that of determining the responsibility of the last employer. It would seem that this is essentially a problem for the referee or the commissioner, but the medical examiner is depended upon for the technical and medical information in most cases upon which the determination is based. New Jersey has no provision requiring the employe to have been employed in his last place of employment for at least a year before he can collect compensation for an occupational disease. Neither does it require the compensation to be divided up among the employers for the 12 months preceding the onset of the illness. The last employer generally pays for the entire condition unless he can conclusively show that the symptoms or signs, such as a musculo-spiral palsy, were

present at the time of hiring. An examination of 260 men for employment in a smelter disclosed at the time of hiring 32 men suffering from lead poisoning, as demonstrated by stippling in the blood picture. Twenty of these 32 denied ever having worked in lead.

Our chief problem occurs in those cases of chronic poisoning with no visible symptoms at the time of hiring who develop symptoms in their new place of employment. The questions we have to answer are: Is this a fresh case of poisoning? Is it an old one aggravated by his new employment? Is it an old case exacerbated by conditions outside of his employment, such as unhygienic living at home, dissipation or injury? These questions can only be answered intelligently when a complete analysis is made of each individual case. A thorough physical and biochemical examination, full information concerning his previous places of employment, as much as can be determined or ascertained concerning his outside mode of living and, finally, what the sanitary and hygienic conditions at the plant are.

One man had worked for a smelter for 18 years and was laid off at the age of 62. He had a double wrist drop which he admitted having had for 14 years, with which he was able, however, to continue at his work. Since this condition was acquired before the passage of the law, no compensation was allowed.

TEMPORARY DISABILITY OR PERMANENT DISABILITY

The temporary disability period is that period during which the sick worker is incapacitated from work on account of his illness. It is the task of the medical examiner to determine when that period should end, if it appears that the man is malingering; or to decide if he requires further treatment and abstinence from work if he is sent back to work too early. If he returns to work of his own accord, temporary disability is automatically terminated. For us to decide when a person is able to return to work is very difficult because of human variability and because of the many social and economic factors not related to illness. The determination must be based on objective findings of a specific nature, either clinical or biochemical. For example, in benzol poisoning a normal blood picture, normal weight and no other objective signs of illness, despite subjective complaints, should warrant the cessation of temporary disability.

Temporary disability terminates:

1. When all symptoms disappear
2. When the man returns to work
3. When symptoms are no longer confirmed by other objective findings

Compensation laws recognize the necessity for reimbursing the injured worker not only for wages lost during the period of his disablement, but also for the permanent effect of severe injuries and their end

results, such as amputations, ankylosis of major joints and paralyses, on the future earning capacity of the worker. Though no standards exist that might be used as a basis for measuring this permanent effect or disability, one of us has suggested in another communication the use of diminished physiological function of injured members as a basis for estimating the reduction in earning or industrial efficiency.

In a similar way, the slow insidious and cumulative effect of industrial poisons bears heavily upon vital organs and results in a definite measure of impairment of working efficiency, if not life expectancy. The medical examiner is charged with the responsibility of determining this measure of impairment in percentages of 100 per cent working efficiency and, upon the estimation submitted, compensation is awarded. For example, 100 per cent total permanent incapacity represents 500 weeks at the maximum rate of \$17 a week, or \$8,500. The permanent changes brought by lead poisoning, on the brain and cranial nerves in encephalopathy cases, on the kidney, blood forming organs, vascular organs or muscular system, must be translated into mathematical terms denoting impaired efficiency and earning capacity. The practice in the past has been for the attending physician representing the sick worker and the carrier's physician to submit estimates of disability based on their best judgment. The estimates submitted were always based on frank guessing with no indication of any basis for them; they were biased for the side they represented, and hence worthless.

We have proposed some basic principle that can be uniformly used that would not be arbitrary, yet would represent in some measure an approach to the requirement of a percentage estimation. The principles recognize first the importance of setting a time when the estimate or appraisal of permanent disability should be made. This period has been called by French writers the "period of consolidation." This period when applied to accidental injuries, is the time when the injury has healed sufficiently to enable the injured worker to return to work without any danger, or where the condition being so severe that he is unable to return to work, the pathological condition has shown no change over a specified period of time. Applied to occupational affections, estimating permanent disability at the time the injured worker returns to work is as a rule too early. The insidious and cumulative effect of industrial poisons takes a long time to indicate their ultimate immutable changes. We should say, therefore, that it is the period when the pathological signs have shown no appreciable change for a period of 4 to 6 months. This would bring this period in cases of lead poisoning to about a year or more after the last onset of the disease and

in mercury poisoning to 2 years and more after the last recognition of the presence of the disease.

Now, how shall we appraise the resultant damage caused by the specific occupational poisons? Let us see first what their effects are. The gross effects of these occupational affections make themselves felt in two ways: on the immediate or intermediate reduction in the strength or complete muscular power of the individual, and on the ultimate life expectancy.

The impairment of muscular strength is the result of direct and indirect action of the poisoning. Through its direct action on the peripheral nerve or neuromuscular mechanism, paresis or paralysis may develop, and through its direct action on the muscle, weakness also occurs. Through its effect on vital organs such as the vascular and renal organs, there is an indirect reduction in the general muscular strength. How can we measure this strength or loss of strength?

Strength may be measured ergographically or through the use of dynamometers. The ergographic method lends itself to much error since it depends for its findings on the fatigue factor, a thing that cannot be measured. Most dynamometers such as the common grip dynamometers give such variable results that they are worthless for any system of accurate measurement and, furthermore, depend on the voluntary control of the patient.

The Martin spring balance and method is an efficient method for determining muscular strength. The pull of eight muscle groups is registered in pounds on the spring balance and the result when multiplied by the factor 6.67 gives an accurate index of the total body strength. The test is simple to make and can be done by trained laymen. The result may be compared to some standard figures for the age, weight and height of the affected workman. These figures are not at hand in large numbers, although we have the results of 340 cases of varying ages, weights and heights. However, it is feasible to compare the strength to the job strength; that is, the minimum strength of workers employed at the same process. For example, if the job strength of color mixers is 2,800 pounds and the muscular total strength of the sick worker, 2100 pounds, there is a reduction of 25 per cent of his normal industrial efficiency.

The Martin strength test has had practical trial, in the investigation of poliomyelitis, soldier's heart, and estimation of job strength. We have used it in the determination of permanent disability of the accidentally injured for the past six years. This test is therefore practical and indicates the possibility of determining approximately the incapacity of workers from occupational poisoning or other affections.

It is a common feeling that the industrial hazards to which workmen are exposed are a definite factor in the reduction of their life expectancy, but there are no data that definitely state what this reduction is. Such data as exist, the mortality statistics by occupation, are not necessarily conclusive. They are by industries rather than by occupations and lump together a large number of widely varying employments. Although no statistics are available, it would seem rational and equitable to all concerned to compensate sick and injured workers on the basis of the reduction of their life expectancy. For instance, we know that the life expectancy for a man with one kidney removed is reduced 25 per cent. This is used as a basis for compensating those who have suffered the loss of one kidney through accident. If sufficient data could be gathered and tabulated to form a basis of such an appraisal, they could be used and checked up later by actual experience. For the present, the only statistics available show a death rate due to lead poisoning of 1 per cent for all cases, while for painters, chronic lead poisoning is given as a cause of death in only 2 per cent of every 11 cases. These figures of course are not significant for many reasons, among which is the fact that cerebral hemorrhage, apoplexy, paralysis, organic heart disease and kidney disease, all of which may be the end result of lead poisoning, are not considered as causes of death due to lead poisoning. Dublin estimates the diminished life expectancy of industrial workers as 8 years compared to non-industrial workers.

DETERMINATION OF THE CAUSE OF DEATH

Finally, it is the obligation of the medical examiner to determine the cause of death in disputed cases of death alleged to be due to occupational disease. As in the case of determining the responsibility of the employer, so in these cases is it necessary to analyze all the data in the case, which should include all medical and laboratory reports that would help to establish a diagnosis of occupational poisoning, the working conditions at his last place of employment, and at other places of employment, the history of previous attacks, and finally and most important, an autopsy. The cause of death of six girls employed in painting luminous dials on watches was undetermined and puzzling. Guesses of phosphorus poisoning, osteomyelitis of the jaw, and Vincent's angina were all made until the autopsy revealed changes throughout the entire hematopoietic system, indicating the use of a radium-like substance in its action, viz. mesothorium.

An experience with the management and adjudication of cases of occupational diseases leads us to the belief that only occupational poisons should be compensated; that all other forms of illness which

can directly or indirectly be traced to industrial conditions should be compensated through a system of workmen's sickness insurance; that increased reporting of occupational disease could be accomplished from a three-point attack: compulsory reporting of the doctor to the board of health, compulsory reporting to the department of labor by the employer, and the establishment of an occupational disease clinic, under state auspices, for the dissemination of information and the demonstration of methods of examination and detection of occupational disease.

The payment of compensation for occupational disease must be made in accordance with medical facts. Compensation for permanent disability should be based on accepted standards, not necessarily arbitrary, such as could be adopted or proposed by such an organization as the American Public Health Association. The use of the strength diminution and reduction in life expectancy is suggested as a rational basis for such an appraisal. Finally, the autopsy is an important factor in determining the cause of death.

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DISCUSSION

Volney S. Cheney, M.D., thought that the time was at hand for the establishment of a Standards Committee for questions in the field of both industrial accidents and diseases.

C.-E. A. Winslow, Dr.P.H., said that the Crampton test should not be taken as a measure of general vitality, but it was of value in determining the response of the blood vessels. The Massachusetts occupational disease compensation law had been unsatisfactory. The law was not specific, as in those states which have schedules, so that compensation had been allowed for tuberculosis, heart disease, etc., where industry was very questionably at fault. As a consequence it had been difficult for employes with these and other afflictions to get work. However, last year the law had been changed limiting its application to specific occupational diseases. What was wanted in states where compensation laws exist is a qualified referee or bureau to act impartially upon the cases presented.

Frank G. Pedley, M.D., asked what was the source of so much mercury poisoning in New Jersey, also what was done with carbon monoxide poisoning. He would also like to hear more about the Martin spring balance in its industrial application.

Wade Wright, M.D., said that the broad coverage law in Massachusetts was too easy and that workmen's sickness insurance is the fairest thing. He felt sure that 4 of the lost years compiled by Dublin for industrial workers had not been considered as due to specific occupational disease, like poisons, etc., but to the general hazards of industry. He felt that one year was too short a time for estimating the ultimate damages produced by lead poisoning.

Otto P. Geier, M.D., asked Dr. Wright what length of time he would consider satisfactory.

George H. Wood, M.D., saw little point in waiting for an autopsy for a diagnosis. Were the three points mentioned for diagnosing lead poisoning, that is (1) proof of exposure, (2) signs of absorption, and (3) evidence of clinical disability, legal in New Jersey or just a personal construction?

Frederick L. Hoffman, LL.D., stated that the estimation of life expectancy is a very difficult proposition. It is necessary to work out life tables both with and without tuberculosis, heart disease, etc., in order to draw worth while conclusions. He commented at length upon the experience of life insurance companies in relation to disability clauses. He was much perturbed by the confusion of lead poisoning with lead absorption and his studies had shown that many cases of the latter were confused with lead poisoning. In addition to the reports already published upon mesothorium in New Jersey there were 5 exposed girls who had developed an almost identical hip affliction and were now hobbling around. It was a sad state of affairs when compensation had been allowed in only 1 of the 6 cases which had died and in only 1 case of sickness of 5. The state seemed helpless and the company was heartless. There are probably two or three more girls yet to be heard from. These cases demonstrate that a time for fixing permanent injury would not be safe under 6 years.

He felt that the broad Massachusetts law, in spite of what had been said, was better than any specific list. Silicosis was more important in this country than lead poisoning. Most cases required an exposure of from 18 to 21 years and practically none occurred under 5 years' exposure. Tuberculosis is superinduced by silicosis, but it was silicosis and not tuberculosis that should be considered in

compensation. The mortality in the Barre, Vt., district from silicosis with tuberculosis is appalling, and many workers suffer.

Emery R. Hayhurst, M.D., stated that occupational disease clinics in connection with medical schools in industrial centers have been a failure in his experience in two different cities. The finding of lead in the urine was only a sign of absorption and not in itself one of lead poisoning. Compensation without actual disability, as the foregoing paper implied, was a new idea. In Ohio, where a state monopoly insurance exists, "the last employer" does not enter into the compensation question. The industries are classified into some 700 groups, and the premiums are fixed for each group every 6 months depending upon the experience of the previous 6 months. In order to create a specific bureau for factory hygiene and sanitation 1 per cent of all premiums collected had been set aside. The occupational disease compensation fund was raised by charging 1 cent for each \$100 payroll. Up to two years ago the occupational disease premiums were varied according to the assumed risks in different industries ranging from a fraction of a cent to as high as \$4.00 per \$100 payroll, but the bookkeeping was so complicated that this method was discontinued. Now all industries pay the same premium for occupational diseases—1 cent per \$100 of payroll. Hence the inducement for a particular plant to allay its disease hazards is not present, but there is some inducement in that each industrial group is interested in lowering its premium rates. Dr. Hayhurst would consider that Dr. Kessler ought to deduct 4 more years after taking off the "industrial 8" mentioned by Dublin, for occupations having specific health risks such as lead poisoning, etc.

W. E. Obetz, M.D., stated that compensation in Ohio is based upon one's inability to work and may be partially apportioned accordingly. "We encourage the reporting of the minor phases of occupational diseases so that they may appear early and disability be stopped before anything permanent occurs. Today we seldom see compensation looking to standard practices."

Dr. Winslow said that after what has just been stated, the great advantage of the general state fund, as in Ohio, can be seen since the previous employment is of no particular interest. Here we have the state bureau vs. the paid expert. Twelve states now have compensation for occupational diseases. He moved that the Industrial Hygiene Section create a committee on "problems of occupational disease compensation looking to standard practices."

This motion, seconded by Bernard S. Coleman, was unanimously carried.

Dr. Kessler, at this point, said that at present industrial commissions were often paying out money in hit and miss fashion. They think they are proceeding in a satisfactory manner but in reality they do not know.

The use of the Martin spring balance test is important because the strength factor is a significant index of the worker's working capacity. For instance, in cases of lead poisoning there is often marked weakness which can be detected by the Martin test. To the same extent the Crampton index is valuable for noting the difference in vasomotor tone.

Whenever industry is a contributing factor it should promote a relief system rather than a damage system.

The cases of mercury poisoning in New Jersey come from batteries and from thermometer works principally. There were 24 cases of mercury poisoning during the past year.

"We regard carbon monoxide poisoning as an accident. Other acute chemical

mishaps are compensated for as accidents. Such was the custom before occupational diseases were included in our compensation schedule."

He said he had used the Martin test in 1340 cases in practice but only in a few occupational disease cases thus far. It is valuable for the measurement of job strength. For instance when tried upon 32 men in the same occupation (machine work) an average finding of 3200 lbs. was obtained. One of these men however suffering from chronic mercury poisoning gave a rating of 2600 lbs. a reduction of approximately 20 per cent in his physical strength.

"We find that occupational disease compensation amounts to only about 1 per cent of accident compensation. We all know that more occupational diseases exist than are compensated.

"The matter of whether we should deduct 4 or 8 or 12 years from the average life expectancy for the industrial worker is difficult to decide. Take the case of the removal of a kidney—how shall we compensate him? We have compensated such an individual to the extent of 25 per cent permanent disability based on his decreased life expectancy.

"There is, of course, a great question as to when we should fix the time limit before permanent disability is estimated. In neuroses, before deciding the case as one of permanent disabling character, we wait 1 year. If there has been no change in the last 6 months of this period the permanent disability is determined at the end of that 6 month period. In mercury poisoning we wait 2 years before deciding the permanent disability. The autopsy is used only when the case of death is one of dispute.

"The coöperation of the attending physician is necessary. His certificate must be backed up by corroborative evidence. Some 90 per cent of claims which come before the Commission are treated by the family physician."

In answer to Dr. Wood, he stated that the three postulates used for determining lead poisoning are not laid down in the statutes but are a valuable guide.

He said he had a mesothorium case at present, a woman who 7 years after exposure to luminous paint fell and hurt her shoulder; she now has pathology in the joint.

"Our proposed occupational disease clinic will work under state auspices. Only a small proportion of our occupational disease cases have permanent disability. A large percentage of our mercury cases however show permanent disability."

He hoped that the committee, which had been asked for, in the motion made by Dr. Winslow, would be a stimulus to other states to adopt compensation for occupational diseases.

Physical Education

THE Ministry of Hygiene and Physical Education of Czechoslovakia recently granted a subsidy of 4½ million crowns to private organizations for the promotion of physical education and in addition appropriated nearly 2 million crowns for the construction of public gymnasiums and athletic fields. The Ministry has also organized various courses on physical education for school and kindergarten teachers.—*Difesa Sociale*, Rome, Nov., 1927, p. 33.

The Technic of Meetings*

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AS a matter of simple courtesy, if for nothing else, it is incumbent on any organization to so "set the stage" for the presentation of technical papers or addresses at its sessions that the speakers may perform effectively, and the audience receive the fullest benefit from the presentations made, free from petty annoyances so common at public meetings of this type. Although the writer is of the opinion that in their organization and conduct the meetings of this Association compare favorably with those of others, there is still room for improvement and, therefore, offers this paper as constructive criticism of the meetings attended in the last six years.

It is, of course, assumed that the papers scheduled for meetings are on timely and worth while subjects; that they have been well prepared; and further that adequate announcement of their subjects and the place and time of presentation have been duly made in the convention program. There then remain three outstanding factors which must be blended to give a degree of harmony approaching the ideal conditions sought:

1. The selection, identification and arrangement of the meeting room
2. The conduct of the meetings by the officers
3. The speaker and his stage setting

Of prime importance is the advance selection of the meeting room. Its size will, of course, depend upon the estimated attendance, an item which will be gauged by the character of the session scheduled. The meeting room should be reasonably convenient to the convention headquarters or registration desk and yet sufficiently isolated that noises from within and without the hotel may not be objectionable. While meeting rooms on upper stories have the advantage of relative quiet from exterior noises, the congestion of elevators before and after sessions, when the attendance is large, should be considered as a contributory disadvantage. In a hotel located in a business district where outside noises are noticeable, inside meeting rooms are preferable provided efficient ventilation control is available. The degree and

* Read at a Joint Session of the Health Officers and Public Health Education Sections of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 18, 1927.

probability of occurrences of various types of common noises should be carefully considered with the hotel officials in advance of selection of rooms.

Some of the exterior noises which must be considered in connection with outside rooms are those caused by trucking in streets and alleys; sand-blasting of adjacent buildings; automobile horns; street cars; elevated trains; boat whistles; news boys; traffic officers' whistles, etc. Interior noises which should be guarded against are those caused by ventilators; elevator machinery, and careless handling of silverware and dishes in adjacent rooms being prepared for private dining purposes. Unless the possibility of these noises affecting meetings is investigated in advance of the selection of the meeting room and provided against they are likely to occur under conditions which cannot be controlled and thus seriously interfere with an otherwise well organized meeting.

The meeting rooms should be easily located by those desiring to attend and to this end should be well identified. The printing in the official program of a floor plan of the hotel adjacent to the convention headquarters while helpful is not always noticed by those in attendance and to some is confusing. It is believed that beginning with the lobby in which registration is conducted there should be posted adequate signs with indicating arrows directing the delegates to the various meeting rooms. In addition, there should be set on an easel directly outside of the entrance to each meeting room, a sign giving notice of the section in session and the time of the opening of the meeting.

The layout of a selected meeting room will, of course, depend upon its size, proportions, and the estimated attendance. The writer is of the opinion that in general a room one and one-half times as long as wide is proportioned for making the most effective seating arrangement. (See Figure I).

The speakers' platform should be at the center of the wall on the long side of the room, most distant from the entrance. It should be elevated at least one foot and be approximately 7 feet deep, 12 feet across the front and properly carpeted. There should be an aisle of not less than 8 feet between the front of the speakers' platform and the first row of seats. Except in cases where seating capacity taxing the room accommodations is desired, it is believed that the three-block arrangement of seats is most satisfactory, as it concentrates the audience within reasonable hearing distance of the speaker. This calls for a center block of from 10 to 12 seats wide, with at least a 4-foot aisle on either side and right and left sectors or blocks. The seats should be set to form concentric rows, with the outside chairs on the end aisle of

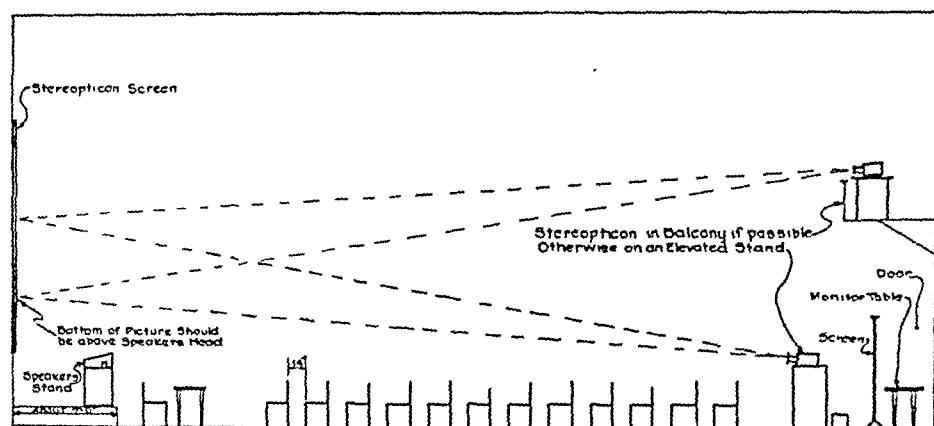


FIGURE I—Sectional Elevation of Meeting Room

the wing sections making approximately a 30° angle with the wall behind the speakers' platform, and on a radial line from this point. Should this result in the rear rows being over 10 or 12 chairs wide, supplemental aisles should be left to facilitate easy access and exit to and from the seats. (See Figure II.)

In case additional seating capacity is needed the five-block system can be used, which is less satisfactory to those sitting in the extreme wings. There should be an aisle at least 6 feet wide at the rear and two sides of the meeting room. To avoid crowding, adjacent chairs in each row should be set 6 inches apart and the distance between the front and rear of chairs in consecutive rows should be at least 14 inches. In the ordinary set-up of chairs for convention purposes these distances are not usually provided for, with the result that those in attendance are crowded and cramped. This condition often develops restlessness which is reflected on the dignity of the meeting shortly after the session is in progress, continuing more or less intermittently throughout the session. The width of seating blocks should be limited to from 10 to 12 chairs, for the convenience of the audience in assembling and departing. Furthermore, persons leaving early or coming late would not then disturb the session seriously by passing out in front of a number of people.

In arranging the set-up of the meeting room special attention should be given to the entrances and exits. These should preferably be in the rear or on a side near the rear of the room. A most annoying condition at our meetings has been the noise of conversation in the lobby which is carried through the entrances and exits. For several reasons it is undesirable to entirely close the entrance and exit doors and under such circumstances the writer is of the opinion that a screen should be placed in front of each entrance. This will not only shut off

external noises but eliminate the distraction to those reading papers caused by the opening and closing of doors. As a further precaution it is believed that a sign reading "Meeting in Session, Please Observe Quiet" posted at the meeting room entrance would have a desirable effect.

On the elevated speakers' platform there should be a stand or table of convenient height at which the person holding the attention of the audience should stand, whether he be the chairman directing the meeting or a speaker. In large meeting rooms, such as those held by our general sessions, amplifiers for directing the speaker's voice to all points of the hall have been much in need. The writer is of the opinion that the desk for the chairman, clerk and stenographer should be at the front of the room between the speakers' platform and the first row of seats. At the rear of the room near the entrance there should be a table for the monitor.

A most important item in the setting of a meeting room is the location of the screen for stereopticon or moving picture illustrations and the machines for rendering these services. It is common in meetings to locate the stereopticon machine in the center aisle, where it is not only in the way of the audience in arriving and departing, but also an obstruction to the vision of those in the room to the rear of the operator. Furthermore, it is a distraction to persons in the immediate vicinity of the machine due to the noise of the operation and the glare of side

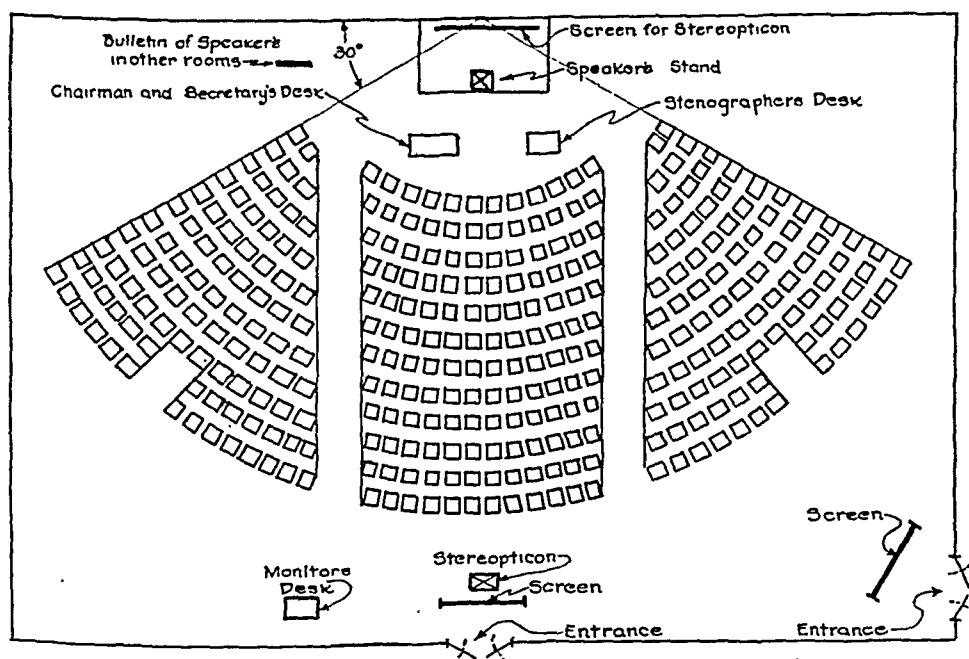


FIGURE II—Plan View of Meeting Room

lighting when pictures are changed. The screen for stereopticon use should, in the writers' opinion, be either directly behind the speakers' platform or slightly to the right. It should be of such size that the bottom of the picture shown can be at least 1 foot over the head of the speaker, who should be equipped with a pointer sufficiently long to direct attention to any portion of the illustration shown on the screen. This will remove the speaker from the line of vision of a portion of the audience and at the same time eliminate the shadows caused by his head and arms in pointing to the illustration. The stereopticon machine should preferably be set up in the rear of the room, directed at right angles to the screen and sufficiently elevated either in a balcony or on a special platform so that the rays of light will not be interfered with by persons arriving and departing during the meeting and so that proper focus may be made at the elevation mentioned. The signal for change of slides should be silent, such as an electric light controlled by a button switch in the hand of the speaker, thus eliminating the cumbersome and noisy make-shift signals so common at our meetings.

For the last two or three years it has been the custom in the meetings of this Association to maintain a bulletin announcing the speaker at other sectional meetings during sessions. This is considered a good practice providing its operation does not distract the attention of the audience. At one of our meetings the messenger received and transmitted information of changes of speakers by telephone, which was very annoying. At another meeting the monitor in charge was unusually noisy in operating the bulletin. If such a bulletin is to be operated it should be of special construction, illuminated by shaded lights and set at least 10 feet to the left of the speakers' platform. Its design should be such that the name plates for speakers may be exchanged with very little annoyance. It would be well if the Association had such equipment for permanent use.

Decorative equipment, such as flags, shields, etc., should be so placed in room as not to interfere with the line of vision to the speaker and the screen, and should be firmly mounted in order that they may not distract attention during the meeting by falling from the walls or tipping over.

CONDUCT OF MEETING BY OFFICERS

Obviously, officers are necessary at meetings to expedite the business in accordance with standards of parliamentary practice and common courtesy. The time honored practice of having the presiding officer and clerk, and in some cases other officials, seated on the speakers' platform is subject to criticism from the standpoint of distracting attention from the speaker who should logically be the center

of interest to the audience. In the writer's opinion, except for business purposes, officers should be conspicuous by their absence. The chairman need only occupy the speakers' platform in opening and closing the meeting and announcing speakers, and at other times he should have the status of a listener. But this state of affairs can only be brought about where meeting plans are perfected in advance and where officers are properly trained in their duties. Too frequently conversation between the chairman or secretary of meetings and pages and others who enter the room distracts interest from the speaker. In some of our meetings the chairman has been little short of a petty nuisance to the speakers, with more dignity than common sense, and the effect of seating him at a table on a level with the other listeners would I believe be for the good of all concerned.

It goes without saying that the chairman should have a full knowledge of his duties and the courage to discharge them. He should have a personality which automatically establishes a dignified atmosphere throughout the session. His enunciation should be clear. He should insist upon punctuality in the opening and closing of the meetings as well as in the length of papers and discussions. It takes an efficient and courageous chairman to do this, but his efforts will generally be appreciated by everyone. A meeting scheduled for 9:00 o'clock should be opened promptly on that hour regardless of the attendance. The chairman should communicate with the speakers in advance of the meeting to be sure that they will be in attendance in accordance with the schedule and that their wants are cared for.

Changes in the order of the program should be discouraged, but if permitted should be announced at the opening of the session. At the opening of the meeting the chairman should request those in attendance who desire to leave the room to refrain from doing so while papers are being read. The writer is of the opinion that on request from the chairman for no smoking during the meeting there would be gracious compliance. Speakers should be requested to seat themselves in the front row reasonably convenient to the chairman's desk, where they may be interviewed, if necessary, with as little distraction as possible and from which place they may ascend to the speakers' platform without delay and inconvenience to the audience.

The secretary should be seated at the desk with the section chairman and automatically perform his duties with as little distraction to the audience as possible. He should, if practical, make arrangements in advance for the turning in of copies of papers read. When serving as chairman he should observe the same rules of conduct mentioned for that officer.

A most important ally of the officials at meetings and one rarely present at our sessions is a monitor. In a well conducted meeting the services of a monitor are extremely valuable if the officers are to be permitted to perform their duties effectively. There should be one on duty in every meeting room where sessions are in progress. Monitors could be enlisted from some of the Boy Scout troops or high school classes. The monitor should have a special desk at the rear of the room, preferably near the entrance. Prior to the opening of the meeting he should see that the layout of the room by the hotel employes is in accordance with the established schedule, special attention being given to such matters as the seating arrangement; the location of the chairman's and stenographer's desk; the speakers' platform and stand; the decorations; stereopticon screen and equipment; the bulletin; all lighting equipment for the meeting room; the ventilating apparatus; the adjustment of the windows and shades; the pointer and drinking water for the speaker. The monitor should receive either from the speakers personally or others charged with their custody the slides to be used in connection with illustrated papers, and should arrange to return them, properly packed, to the owner. He should also attend to the changes in the bulletin announcing speakers at other meetings and reciprocate relative to speakers in the room under his charge. He should receive all special messages during the meeting and quietly deliver them in written memoranda to the chairman. He should keep a record of the attendance, reporting to the secretary, and should periodically adjust the heating and ventilating equipment to provide proper atmospheric conditions within the meeting room. He should thoroughly understand the lighting system for the meeting room in order to make adjustments necessary when stereopticon service is used.

The stenographer for all meetings should be provided with desk space reasonably convenient to the section chairman so that speakers may be identified, and to receive proper instructions and information for effectively reporting the progress of the session. Stenotype operators should be properly instructed in their duties in advance of the meeting, taking orders there only from the section chairman.

THE SPEAKER AND HIS STAGE SETTING

In advance of meetings the speakers should announce their presence to the chairman and receive any last minute instructions. They should be seated in the front row convenient to the chairman and the speakers' platform, thus avoiding the embarrassment and delay which invariably develops when the presence of speakers is unknown or their location in the room such that when called upon they must disturb all present in the aisle in which they are seated.

All arrangements for turning in copies of reports and for stereopticon service should be made before the meeting opens. The passing out of samples, reprints, etc., by the speaker prior to or during his presentation should be discouraged. These should be given to the monitor for distribution before or after the meeting and the request for announcement of this procedure made to the chairman. If large demonstrations, such as models, maps or charts are to be used, the speaker should arrange with the monitor in advance of the meeting for their display.

If the speaker must first attend another meeting and arrive late this fact should be made known to the proper section chairman. After introduction by the chairman and proper acknowledgment by the chair the speaker should always mount the speakers' platform. The so-called reticence and reserve which some speakers display by not mounting the speakers' platform frequently makes it difficult for persons in distant sections of the room to see and hear them, and usually weakens the presentation considerably. During periods of discussion the speaker should retain his place on the stage. If stereopticon illustrations are used, and it is practical to do so, speakers should shorten the time of their presentation by having a second person point to the important features being illustrated while the paper is being presented. Frequently speakers read a paper and then practically double their allotment of time by repetition in demonstrating with stereopticon illustrations. The practice of breaking the presentation of papers by such demonstrations is a weakness in our programs which could be avoided if arrangements were made for assistance in advance.

In conclusion, I desire to say that by comparison the A. P. H. A. meetings are generally well conducted, their weaknesses being an inheritance of custom and lack of training by section officers, seasoned with an element of courtesy to the individual which gives way to the efficient organization of a well balanced machine. The keynote is mutual coöperation and team work, with the executive officers of the Association modestly directing the stage with dignity and discipline from behind the screen.

Relations Between Health Departments and Hospitals.*

THE relations which have grown up between hospitals and health departments in recent years have been discussed at several meetings of the American Public Health Association, more particularly since the Boston meeting in 1923 when considerable interest in the subject was shown.

In 1926 the Association together with the *Modern Hospital Magazine* collected some information regarding the extent and form of coöperation between hospitals, dispensaries, etc., and health departments in the fields of laboratory examinations, hospitalization of communicable diseases, and maintenance of public health clinics, in cities of 40,000 population and over. The information secured showed that a goodly number of hospitals had certain working relationships or agreements with municipal, county or state health departments.

The Association believed it would be helpful both to health officers and to hospitals, to have more information on the exact nature of this coöperation. The undersigned committee was appointed by the chairman of the Committee on Administrative Practice to make this inquiry. Three members were suggested informally by the president of the American Hospital Association, including the chairman of that organization's Committee on Public Health Relations.

A contribution of \$1,500 was secured from private sources to finance the work. The office of the American Public Health Association assumed responsibility for the collection, analysis and tabulation of facts.†

The committee met in February, 1927, and agreed upon a plan of study, and again in September to review the facts collected and to determine conclusions. This report was then presented in substance to the full Committee on Administrative Practice and accepted thereby.

The study embraced the character and extent of the working relationships between public health departments (municipal, county or state) in cities of 30,000 population and over with general, maternity,

* Report of a Study by the Committee on the Study of the Relations of Health Departments and Hospitals, a sub-committee of the Committee on Administrative Practice, presented to the Health Officers Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 19, 1927.

† The committee appreciates the services of Anna C. Phillips, R.N., who made the necessary field visits.

and children's hospitals of 25 beds and more, and clinics and health centers unattached to hospitals in these cities. Hospitals directly under health department control were, of course, excluded.

The specific areas in which coöperation was studied were 3, namely, laboratories, hospitalization of communicable diseases and clinics. For the purposes of this inquiry, coöperative working relations were defined as follows:

Laboratory Service—Examinations made for a hospital by a health department or examinations made for a health department by a hospital, with or without payment for the work.

Hospitalization of Communicable Diseases—The care in non-departmental hospitals of scarlet fever, diphtheria, measles, whooping cough, tuberculosis, syphilis, gonorrhea or smallpox at the request of, or in coöperation with, a health department, whether paid for or not from public funds.

Maintenance of Clinics of Public Health Interest—Joint operation, or aid by health departments in personnel, supplies or funds to the operation by a hospital of clinics of generally recognized public health importance, i.e., prenatal, preschool, well baby (infant welfare), tuberculosis, venereal disease, dental hygiene, hookworm and malaria, and also of some clinics in which the public health responsibility may be considered debatable—eye (all cases), refraction only, ear, nose and throat, mental, child guidance, periodic health examination, orthopedic and trachoma.

A summary of the work done follows:

1. Letter and questionnaire to health officers in 247 cities representing 242 cities over and 5 cities under 30,000 population; supplemented by a follow-up letter to those not replying and a notice regarding the study in the Association's monthly news letter to health officers for June, 1927.

2. Letter and questionnaire to 1,365 general, maternity and children's hospitals in the 247 cities, including 28 dispensaries, health centers, etc., in 12 of the cities selected tentatively for field visit because of unusual situations disclosed by the information furnished.

The replies from hospitals were used to elucidate the situations reported upon by health officers. They also constitute the only source of information for those cities from which no official reply was received.

The percentages of responses to both inquiries, according to size of city are presented in Table I.

3. Correspondence with health officers to secure further information on the details of situations reported upon and to clarify replies which were not definite or which conflicted with the facts furnished by local hospitals.

4. Visits to cities in which unusual types of coöperation have developed to secure opinion regarding the advantages, desirability and details of operation.

The facts furnished cover about one-half of all the cities under 100,000 population and over 80 per cent of those of 100,000 and more.

The outstanding general impression from the study is that there have grown up a number of specific and evidently useful forms of coöperation between health departments, hospitals, and various voluntary agencies, and this coöperation has developed spontaneously and

TABLE I

PERCENTAGE OF REPLIES FROM HEALTH OFFICERS, HOSPITALS, ETC., CLASSIFIED
ACCORDING TO SIZE OF CITY

Population Group*	Number of Cities	Per Cent Replies from Health Officers	Number of Hospitals, Etc.	Per Cent Replies from Hospitals, Etc.
Group I**				
30,000-40,000	64	41	139	23
Group II				
40,000-70,000	83	48	220	26
Group III				
70,000-100,000	32	47	141	20
Group IV				
100,000-200,000	35	80	204	29
Group V				
200,000-300,000	12	75	113	26
Group VI				
300,000-400,000	5	80	57	26
Group VII				
400,000 and over	16	88	491	35
Total	247	55	1365	29

* Based on the Federal Census of 1920

** Includes five cities under 30,000 population

without propaganda. The officials of the participating organizations in each community have acted on the basis of immediate local situations without much, if any, knowledge that similar undertakings are growing up elsewhere.

The main advantages of such coöperation in the opinion of those participating in such programs are: (1) Economy; (2) the ability to cover special fields to an extent not possible with the funds available directly for the health department; (3) better quality of service; (4) the possibility of reaching a wider audience through close contact with voluntary health organizations with their broad appeal; and, (5) the possibility of undertaking new services through pooling of resources, which could not be undertaken satisfactorily by one agency alone.

FINDINGS

The extent to which these various forms of coöperative relationships exist throughout the country is indicated by the number of cities reporting joint health work of this character, and the number of institutions (hospitals, dispensaries, health centers, and other voluntary health agencies and social agencies with health activities), involved in the information furnished. These facts are set forth in Table II, and commented upon in succeeding pages. The committee has had prepared a detailed summary of the types of coöperation found in each of the 148 cities reporting, and while this is too extensive to print, there are mimeographed copies in the office of the Association, available on request of any member.

TABLE II

EXTENT OF COÖPERATION REPORTED ON BETWEEN HOSPITALS, DISPENSARIES, ETC.,
AND HEALTH DEPARTMENTS

Popula- tion Groups	Total Cities	Fields of Coöperation Reported Upon								
		Laboratory			Communicable Diseases			Clinic Service		
		No. Cities	Per Cent	No. Or- ganiza- tions Repre- sented	No. Cities	Per Cent	No. Or- ganiza- tions Repre- sented	No. Cities	Per Cent	No. Or- ganiza- tions Repre- sented
I	64	22	34	36	12	19	23	18	28	14
II	83	38	46	60	20	24	29	34	41	65
III	32	20	63	37	10	31	17	8	25	16
IV	35	12	30	27	6	17	11	10	29	28
V	12	8	67	14	1	8	1	4	33	8
VI	5	4	75	21	1	20	4	1	20	10
VII	16	15	95	111*	6	38	9	12	75	58
Total	247	119	48	306	56	23	94	87	35	199

* Exclusive of an unstated number of institutions in cities in which health department furnishes service to any hospital upon request

Types of Coöperation in Laboratory Service—A new point of interest, not anticipated when the study was planned, is the extent to which health departments purchase laboratory service from privately operated hospitals. In Schenectady, N. Y., the health department pays \$10,000 annually to a voluntary hospital for all the examinations, both for the department and for a municipally operated health center. In Dubuque, Ia., a private hospital supplies service to the health department for \$200 a month. In Muskegon, Mich., a voluntary hospital does examinations for diphtheria, tuberculosis and gonorrhea for the health department on the basis of a fixed charge for each item.

Two interesting variations are in McKeesport, Pa., where the city provides a pathologist and the salary of a technician to a hospital's laboratory which does all examinations for the health department except urine and pathological specimens; and in Harrisburg, Pa., where one of the hospitals occasionally makes examinations for tuberculosis, syphilis and gonorrhea; and also of urine, feces, fowl and meat from slaughter houses, pneumonia typing and tuberculosis cultures, the city furnishing a technician to the hospital to assist with this work.

The reverse form of coöperation, in which hospitals use the health department laboratory, is chiefly for:

1. Examinations for acute communicable diseases—diphtheria, typhoid, tuberculosis, syphilis or gonorrhea

2. Examinations of the more unusual conditions with which hospitals rarely deal—rabies, malaria and plague, chemical analysis of food and drugs, milk and water

3. Checking the work of their own laboratories, as in diphtheria and syphilis

State health department laboratories are used fairly extensively both by city health departments and public and private hospitals for examinations for syphilis, and appear to be the chief reliance in many

of the smaller communities in respect to examination of food and drugs, milk and water, and for rabies.

One of the interesting situations disclosed by the study is the extent to which the health departments in the larger cities furnish laboratory service to non-medical voluntary organizations, such as settlements, day nurseries, neighborhood houses, and other philanthropic agencies. These ordinarily do not maintain laboratories but frequently need certain routine examinations. Boston, Los Angeles, Chicago and San Francisco present instances of this type.

In comparatively few cities does the health department receive payment for work done for hospitals, dispensaries, etc. In some localities the county health department pays the municipal laboratory for county work done, as in Springfield, O., where the city is paid \$.50 for examinations for diphtheria, tuberculosis, gonorrhea, and of urine, and \$1 each for chemical analyses of food and drugs, milk and water.

The question naturally arises: What should be the municipal or state health department control of the standards of work in hospital laboratories diagnosing communicable diseases? Of the procedures in privately owned laboratories furnishing similar services to hospitals? The steps already taken by state health departments in this respect are illustrated by Decatur, Ala., where the laboratory used by the municipal health department is an official branch of the State Department of Health; and by Albany, N. Y., where the private laboratory used by the health department is officially endorsed by the State Department of Laboratories and Research.

Types of Coöperation in Hospitalization of Communicable Diseases—The utilization by health departments of private general hospitals for the care of acute communicable diseases is now recognized as a sound policy which holds advantages for both groups. For the health department these are chiefly: (1) economy in the cost of controlling communicable diseases; and (2) provision of better service.

The hospital derives advantage from the arrangement due to: (1) the broader service it can offer internes; (2) the student nurses being able to receive desirable experience in this special field at their own institution instead of being sent to other hospitals; and (3) payment from public funds for patients with communicable diseases who are unable to pay or are hospitalized against their will.

Typical of situations in which the payment for hospitalization comes from the health department is Newport, R. I., where a voluntary hospital cares for scarlet fever, diphtheria, syphilis and gonorrhea for \$3.50 a day, paid through the health department which exercises full control over admissions and discharges, a communicable disease hos-

pital being used only in extensive emergencies when the cases exceed the capacity of the contagious disease unit of the private institutions. In Pittsfield, Mass., a voluntary hospital receives all types of communicable diseases excepting tuberculosis and smallpox, the city providing an annual subsidy of \$5,500 for the maintenance of the service, plus \$21 per week per patient cared for, paid through the health department.

Among the cities in which care is furnished and payment made other than through the health department, is Camden, N. J., where two voluntary hospitals provide the city with service, one admitting scarlet fever, diphtheria, measles, syphilis, gonorrhea and smallpox, and the other, syphilis and gonorrhea only. No specific payment is made for the care furnished patients with communicable diseases as it is considered to be included in annual appropriations of \$25,000 made to each institution by the City Commissioner and the County Board of Freeholders.

Four voluntary hospitals in LaCrosse, Wis., receive syphilis and gonorrhea, one of them in addition receiving all other types of cases, for which the city appropriates \$1,200 annually to cover the cost of the care of indigents, the county paying for county charges and transients. Examples of payment by a per capita daily or weekly rate are: Chicopee, Mass., hospitalizing all cases except tuberculosis and smallpox in two private hospitals for from \$18 to \$21 per week; Jamestown, N. Y., hospitalizing all types of cases for \$4 a day; and Stamford, Conn., where \$14 a week is paid for town (indigent) cases of communicable disease, including smallpox.

Some dozen cities which report they do not maintain any municipal hospitals for communicable disease purchase service from nearby cities which have such hospitals. For example, Lakewood, O., buys such care from the Cleveland City Hospital, the department of health paying at the rate of \$5 per day; cases of communicable disease in New Britain, Conn., are cared for in Hartford, the Department of Charities carrying the responsibility of payment for those unable to pay.

An interesting point is the fact that coöperation between hospitals and health departments in this field is reported mainly from cities under 200,000 population, only 8 of the cities over 200,000 noting arrangements in this respect.

Not the least significant of the entrance of the private hospital into this public health field, is the number which receive smallpox—a situation which seems to presage the doom of the “pest house.”

The numerous and successful instances of coöperation in this field suggest their desirability and community value. In the development of such programs it should be recognized that in the hospitalization of

communicable disease, the responsibilities of the health department relate primarily to approval of quarters, equipment, etc., and to the admission and release of patients, but do not extend to administrative responsibility within the hospital.

The various methods of payment in effect indicate that reimbursement of privately operated hospitals on a per capita per diem basis is well established; also that per capita payment for the amount of care furnished plus an annual subsidy to cover hospital overhead is in successful operation. The last plan seems the fairest to the hospital.

Attention has been called to the fact that payment is often made from city or county funds, but not through the health department; also that appropriations from public funds sometimes cover a variety of hospital services, including the care of patients with communicable diseases, the amount available for this purpose not being separately listed.

In the interest of sound and uniform accounting for health work, methods of payment of public funds through other channels than the health department should be abandoned in favor of including all amounts expended for the control of communicable disease, including hospitals, in the health department's budget.

Types of Coöperation in Public Health Clinics—The field of public health clinics includes so many different kinds of service and touches so many agencies other than hospitals, it naturally presents a greater opportunity for coöperative effort than laboratory service or communicable disease care.

Coöperation between hospitals and health departments in this field in general consists of the furnishing by the hospital of quarters and equipment while the health department provides some or all of the medical, dental, nursing, social service or clerical personnel. The individual situations vary from complete control of the clinic by the hospital, with the health department merely coöperating in public health relations or perhaps by furnishing a flat financial subsidy, to the other extreme in which the hospital furnishes only the quarters and the health department provides all the personnel, supplies, drugs, and other material.

The numerous examples reported upon fall into two main groups: The first is in the field of clinic service which largely involves the diagnosis and treatment of disease, such as tuberculosis and venereal disease clinics. The location of such clinics in the organized out-patient department of a hospital makes available diagnostic and treatment resources which are seldom provided in their entirety for isolated clinics. The second type of clinic is exemplified by the baby health station or the

prenatal clinic in which the diagnostic and treatment facilities of the out-patient department are less important.

There appear, however, to these services as to the others, certain advantages from coöperation between the hospital and the health department; namely, economy to the health department (therefore to the community) through the use of the hospital plant and personnel, which otherwise would have to be provided by the health department. The same aspect of economy of plant and personnel applies to coöperation between health departments and voluntary health organizations, such as the Visiting Nurse Association, tuberculosis societies and others.

Representative examples of the coöperation illustrate a wide range of organizations involved and much diversity in the services jointly carried. Thus the health departments of Orange, East, West and South Orange and Maplewood, N. J., jointly support a venereal disease clinic at a voluntary hospital, the budget for which is prepared at the beginning of the year and each locality assessed on a per capita basis. The Orange Department of Health supplies social and clerical service, equipment, stationery and postage. The same hospital is active in programs for vaccination against smallpox and immunization of pre-school children against diphtheria, the health department supplying the material.

In Pontiac, Mich., one of the municipal well baby stations is conducted at the Visiting Nurse Association, the health department furnishing the medical nursing, and clerical personnel for tuberculosis and venereal disease clinics conducted at the county physician's office, and furnishes the quarters for a dental clinic conducted by the board of education and for an orthopedic clinic conducted by a county orthopedic association (Rotary Club). By agreement with a municipal and private hospital children are operated upon for the removal of tonsils and adenoids at a flat rate of \$3, the department paying for indigent cases.

In many states hospitals and dispensaries are coöperating with state health departments in the fields of tuberculosis, social and mental hygiene and orthopedic conditions in children. Thus, for venereal disease clinics in private hospitals the state department provides a subsidy in Brockton, Mass., the personnel in Chester, Pa., and Lima, O., and in Holyoke, Mass., \$1,000 annually. In Scranton, Pa., the state provides psychiatric social service for a mental clinic conducted by an independent dispensary under the direction of the psychiatrist in charge of the mental disease hospital of the Scranton Poor District.

The instances of correlated work in public health clinics between health departments and voluntary health agencies are both . . .

and original in their application of coöperative principles. In addition to those previously mentioned in connection with hospital programs, the following may be cited as unusually suggestive. In Hartford, Conn., the Visiting Nurse Association furnishes the nursing service at cost to the health department for its infant welfare and preschool stations and for tuberculosis and venereal disease clinics conducted by the department at a voluntary dispensary maintained by the Community Chest. The state department also conducts a clinic for juvenile tuberculosis at the same dispensary in coöperation with the Visiting Nurse Association, and furnishes the salvarsan for the dispensary's venereal disease clinic.

In the larger cities coöperation in regard to clinics takes various forms. One of the most frequent is in the conduct by health departments of tuberculosis clinics in hospital out-patient departments, the hospital providing the quarters and the department the medical and nursing service. In Baltimore, Md., the department of health furnishes the medical, nursing and clerical personnel, supplies and drugs, and pays \$1,000 a year to a voluntary hospital for the maintenance of a tuberculosis clinic and a dental clinic for school children. Another hospital coöperates with the state in the operation of a clinic for venereal diseases, the state paying the cost. This same institution reports a close working relationship with the visiting nurses of the city and state health departments. There is an agreed area distribution of the city between hospitals and the health department in regard to prenatal care.

In Boston, Mass., a habit clinic conducted by one of the voluntary hospitals is furnished physicians and a psychiatric social worker by the health department. A dispensary receives \$1,000 a year from the state for a child guidance clinic, furnishing quarters, supplies and material, the state providing the personnel. The same dispensary conducts a cancer clinic, the state paying \$500 annually for rent of the radium used. This institution also holds a well baby clinic for which the city department supplies the personnel.

Other Forms of Coöperation—In addition to the relationships in three specific fields covered, it is reported that hospitals, health and social agencies and health departments are associated in such campaigns as May Day, preschool child health examinations, sight saving and immunization against diphtheria. Some of the unusual public health programs reported are in the following cities: Danville, Ill., where the attending staff of a private hospital held a course of free lectures in public health last year, a feature to be continued this year; Denver, Colo., where all public and private health groups recently conducted a series of meetings dealing with the question of medical service for chil-

dren attending the city's parochial schools; Rockford, Ill., which holds a "Better Health Week" in which all coöperate; and Covington, Ky., where a voluntary hospital carries on an active toxin-antitoxin campaign, the city appropriating \$300 for the service, in addition to an appropriation of \$2,400 for other work.

CONCLUSION

The committee does not think that this study has reached a stage at which specific recommendations should be made, defining the scope, policy and methods of coöperation between health departments, hospitals and other voluntary agencies. A few comments and suggestions have been made in the course of this report, but the committee wishes at present to make only one recommendation. It is urged that before the establishment or extension of health department services in the fields of laboratory work, care of communicable diseases or clinics of public health interest, consideration be given to the possibility of coöperation with hospitals or other agencies, with the aim of providing the maximum service to the public at the minimum cost.

Whatever value attaches to the present report will be in assisting the officers of both health departments and of hospitals to become familiar with plans of coöperation which have been found actually at work, to evident mutual advantage, in many places throughout the country. It is never wise to attempt to force coöperation. It is well that coöperative endeavors be conscious and considered instead of merely sporadic, and that they shall be able to learn from one another as to policies and methods.

MICHAEL M. DAVIS, Ph.D., *Chairman*

HAVEN EMERSON, M.D.

W. C. RUCKER, M.D.

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GEORGE C. RUHLAND, M.D.

D. L. RICHARDSON, M.D.

W. F. WALKER, Dr.P.H., *Secretary*

NOTE: This is a condensation of the full report. Mimeographed copies have been prepared of the types of coöperation found in each of the 148 cities reporting, and are available to any member upon request.

Tattoo||Regulations

IN only one city in the country is tattooing prohibited, and in only three is it regulated, according to Marvin D. Shie, M.D., writing in the *Journal of the American Medical Association* for January 14, 1928. Dr. Shie points out that the number of infections due to tattooing is not inconsiderable, although less today than formerly. He suggests that the removal of tattoo marks should be undertaken only by a qualified physician, and that this work should fall within the scope of state medical practice acts.

A Suggested Monthly Check Sheet*

Based Upon Appraisal Form for Rural Health Work,
A. P. H. A.

H. S. MUSTARD, M. D., FELLOW A. P. H. A.

Health Officer, Rutherford County, Murfreesboro, Tenn.

THE primary object of this paper is to present a simple reporting device, the use of which will help the rural health administrator to maintain balance in his program and which will, at the same time, provide him with the data which he needs for monthly checking of particular health services. That the health officer has had difficulty on both these counts is generally admitted, and those engaged in administrative positions in the health field have given much thought to the problem of reports—what data should be reported and in what arrangement these data might best be presented.

It would seem almost axiomatic that a report should be made up of material representing accomplishments, and that this material should be so arranged that the reader might easily evaluate the work reported. An ideal type of report would contain figures representing results, listed by the reporter, and subjected to qualitative analysis and quantitative measurement by the reader. Such a scheme, however, carries with it certain inherent difficulties, the first of which is that results are not achieved upon a monthly basis. And too, many factors, uncontrolled, difficult of correlation and often unrecognized, enter into accomplishments which might appear to be the direct result of health work; and the administrator must be careful lest he make claims prematurely. For these reasons the usual monthly report is not set up to show the *results* of health work, but instead provides for the reporting of activities of the organization. If we are justified in assuming that a certain activity, if carried on continuously for a sufficient length of time, will attain a specific result, this practice seems sound; it is generally accepted.

In considering the methods of presentation of material in the monthly report, it becomes increasingly apparent that very few of those engaged in rural health work are satisfied with the type of reports used. From such presentation of figures it is difficult to determine organization trends or program balance. Monthly report forms at present in use

* Read before the Health Officers Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 18, 1927.

RURAL APPRAISAL FORM, A.P.H.A. REPORTING VITAL STATISTICS AND COMMUNICABLE DISEASES

ITEM	STANDARD	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
BIRTHS REPORTED (WHITE)	50 PER MONTH	42/50	101/100	143/150	179/200	220/250	264/300	311/350	374/400				
BIRTHS REPORTED (COLORED)	20 PER MONTH	16/20	34/40	56/60	66/80	83/100	98/120	116/140	134/160				
CASES OF TYPHOID	7 PER DEATH	8/14	10/14	15/14	15/14	18/14	26/21	34/28	44/42				
CASES OF DIPHTHERIA	15 PER DEATH	2/0	4/0	4/0	5/0	5/0	7/0	10/0	11/0				
CASES OF SCARLET FEVER	50 PER DEATH	0/0	1/0	4/0	4/0	4/0	5/0	6/0	8/0				
CASES OF MEASLES	100 PER DEATH	2/0	23/0	55/0	89/0	99/0	100/0	100/0	100/0				
CASES OF WHOOPING COUGH	25 PER DEATH	22/0	31/25	36/50	36/50	41/50	43/75	44/100	45/125				

CHART I—ARRANGEMENT OF THE CHECK SHEET

The items selected are from the section of the check sheet upon which vital and morbidity statistics are recorded. The first or left hand column shows the items to be considered; the second column carries the monthly standard against which the item is to be checked. The standards for white and colored births are based upon population unit; the case rate standards for communicable diseases are common to all rural areas. The remaining vertical columns provide a block for checking each item month by month. It will be noted that each block is divided by a diagonal line, running downward from right to left, converting the report item for each month into the form of a fraction. In each instance the denominator represents an accumulation of the monthly standard of work to be done; the numerator represents actual accomplishment. For instance,

the monthly standard for colored births is 20. Therefore in January this number should have been reported. Actually, reports of only 16 colored births were received. For the month of February, the standard demands 20 more colored births, and the denominator accumulates to 40; the numerator for February is made up of the 16 reports received in January plus 18 more received in February. Thus at the end of the second month it becomes apparent that there had been received 6 births less than could be expected, and at the end of eight months the deficiency had become 26—the difference between numerator and denominator.

The communicable diseases case report standards require no particular explanation. It illustrates quite clearly that whooping cough is not reported satisfactorily.

show the record of monthly activity by item, and on the same line in a parallel column, the total of that item for the year to date. Some of these reports, for purposes of comparison, carry a record of activities for the corresponding month of the year past. Thus the reader of the report is furnished with figures setting forth so many cases of typhoid reported, so many school children examined, or so many immunizations against diphtheria. These data are valuable and interesting, but unless the reader of the report is familiar, in most minute detail, with the area reported upon, it is probable that he will not recognize the implication of many significant figures; nor will he be in a position to make

COMMUNICABLE DISEASE CONTROL

ITEM	STANDARD	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
VISITS TO DIPHTHERIA	3 PER CASE	11 6	20 12	20 12	24 15	24 15	27 21	41 30	51 33				
VISITS TO TYPHOID	3 PER CASE	11 24	26 30	52 45	63 45	81 54	102 78	143 102	205 132				
VISITS TO SCARLET FEVER	2 PER CASE	0 0	1 2	9 8	9 8	9 8	9 10	12 12	20 14				
VISITS TO MEASLES	1 PER CASE	0 2	23 23	56 55	77 89	83 99	83 100	83 100	83 100				
VISITS TO WHOOPING COUGH	1 PER CASE	8 22	19 31	22 36	22 36	27 41	29 43	33 44	33 45				
CONSULTING DIAGNOSTIC SERVICE	1*PER MONTH	4 1	7 3	13 4	17 6	21 7	21 9	27 10	28 12				
IMMUNIZATIONS - T.A.T. TO PRE-SCHOOL	60 PER MONTH	16 60	26 120	28 180	29 240	49 300	67 360	98 420	135 480				
T.A.T. SCHOOL	60 PER MONTH	117 60	155 120	214 180	323 240	332 300	339 360	381 420	428 480				
TYPHOID	100 PER DEATH	27 200	192 200	293 200	615 200	663 200	980 300	1512 400	2051 600				
SMALLPOX	90 PER MONTH	51 90	317 180	555 270	687 360	106 450	138 540	177 630	234 720				

CHART II—ILLUSTRATIVE ITEMS ON FIELD WORK CONCERNED WITH THE CONTROL OF COMMUNICABLE DISEASES

The standard for visits to cases are those of the *Appraisal Form for Rural Health Work*. With the exception of typhoid immunization the other standards are based upon population. For instance, the yearly standard for consulting diagnostic service is 50 calls per 100,000 population. The population unit in Rutherford County is 32962. The total for the year in this county would be 17 or a little more than 1 per month. The standard for toxin-antitoxin im-

munization in preschool children is 20 per cent of the preschool population. The preschool population unit is 3461—total for year 692, approximately 60 per month.

Toxin-antitoxin in grade schools: 10 per cent of grade school population; population unit 7154; total for year 715; for month 60.

Smallpox: 3 per cent annually of total population; 990 per year; 90 per month (approximately).

a critical analysis of the situation reflected in the report, as he would be were there listed with each item reported a standard for comparison.

All of the above discussion is preliminary to consideration of such standards and their utilization in reports. The *Appraisal Form for Rural Health Work*, recently developed by the Committee on Administrative Practice, American Public Health Association, provides a most valuable instrument for measuring health department activities. Standards for activities are generally of two kinds: those common to all rural areas, as the reporting of 7 typhoid cases for every typhoid death, and those based upon population unit and consequently applicable only to the particular county or district concerned. Morbidity report stand-

HEALTH OF THE CHILD

ITEM	STANDARD	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
PRE-NATAL ·		24	43	65	90	110	125	152	164				
CASES UNDER SUPERV'N	16 PER MONTH	16	32	48	54	60	96	112	128				
VISITS TO		80	163	250	342	453	521	616	689				
PRE-NATAL CASES	47 PER MONTH	47	94	141	188	235	282	329	376				
DELIVERIES		0	0	0	0	1	4	6	17				
IN HOSPITALS	7 PER MONTH	7	14	21	28	35	42	48	55				
INFANT ·		151	335	450	681	924	1071	1305	1538				
NURSING VISITS	88 PER MONTH	88	176	264	362	440	528	616	704				
		18	44	57	75	109	172	220	290				
MEDICAL CONFERENCES	150 PER MONTH	150	300	450	600	750	900	1050	1200				
		0	2	6	12	16	18	19	25				
NURSES CONFERENCES	42 PER MONTH	42	84	126	168	210	252	294	336				
PRE-SCHOOL ·		259	499	732	1009	1346	1521	1866	2074				
NURSING VISITS	30 PER MONTH	30	60	90	120	150	180	210	240				
SCHOOL CHILD ·		298	689	1337	1371	1401	1433	1501	1608				
PHYSICAL EXAMINATION	150 PER MONTH	150	300	450	600	750	900	1050	1200				
		16	22	40	40	40	40	40	85				
PARENTS PRESENT	25 %	75	172	334	317	350	358	375	402				
		11	26	87	93	96	97	113	122				
TONSIL & ADENOID	13 PER MONTH	13	26	39	52	65	78	91	104				
		85	192	333	432	526	611	707	733				
NURSING VISITS	100 PER MONTH	100	200	300	400	500	600	700	800				
SCHOOL		NR	NR	NR	NR	NR	NR	33	41				
BUILDINGS INSPECTED	8 PER MONTH	8	16	24	32	40	48	56	64				

CHART III—DERIVATION OF STANDARDS

Prenatal under supervision:

25 per cent of total births

Total births 738—Total for year 185

Approximate for month 16

Visits to Prenatal cases:

750 visits per 1,000 total births

Total births 738—Total for year 553

Approximate for month 47

Deliveries in Hospital:

10 per cent total births—Total births 738

Total for year 74—Approx. for month 7

Visits in behalf of infants:

1500 per 1000 live births

Total for year 1050

Approximate for month 88

Visits to Medical Conference:

2500 visits per 1000 live births

Total for year 1755

Approximate for month 150

Visits to Nursing Conference:

800 visits per 1,000 live births

Total for year 500

Approximate for month 42

Nursing Visits to Preschool:

100 visits per 1,000 preschool population

Preschool population 3461

Total for year 346

Approximate for month 30

ards are thus provided and can be used on a monthly basis. By simple computations other monthly standards are easily arrived at, usually by dividing the year's quota by 12.

In order to illustrate the practicability of the utilization of this standard in the monthly report, a number of charts have been prepared from the check sheet in use in Rutherford County, Tenn.

SANITATION

ITEM	STANDARD	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
INSPECTIONS	50 PER MONTH	39 50	75 100	120 150	193 200	252 250	482 300	673 350	834 400				
TUBERCULIN TESTS	100% NO. TESTED NO. DUE	0 NR	106 106	178 227	178 227	178 239	203 251	203 251	261 353				
INSPECTION DAIRY FARMS	8 PER MONTH	23 8	42 16	72 24	82 32	99 40	130 48	141 48	145 64				
RAW MILK UNDER 50,000	95%	13 22	20 34	28 44	33 51	40 67	41 69	41 69	41 69				
PASTEURIZED MILK UNDER 50,000	100%	7 9	8 14	10 18	12 20	13 23	14 24	15 25	15 26				
PASTEURIZED MILK % OF WHOLE	100%	40 100	40 100	40 100	40 100	40 100	40 100	40 100	40 100				

CHART IV—DERIVATION OF STANDARD

Inspections:

1500 inspections per 100,000 population
500 for year—Approximately 50 per month

Inspection of Dairy Farms:

Standard semi annual
45 farms—00 inspections for year
Approximately 8 per month

LABORATORY

ITEM	STANDARD	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
TYPHOID FEVER	30 PER DEATH	19 60	45 60	61 60	74 60	88 60	104 90	132 120	169 180				
DIPHTHERIA	100 PER DEATH	38 0	101 0	166 0	188 0	191 0	212 0	278 0	295 0				
TUBERCULOSIS	5 PER DEATH	0 25	10 45	19 60	24 70	32 80	38 95	39 130	43 145				
SYPHILIS	6 PER CASE	3 0	26 42	39 48	53 66	67 96	79 108	84 138	106 138				
GONORRHEA	3 PER CASE	5 0	9 0	11 12	12 12	14 12	15 12	17 12	17 12				
MILK	6 PER MONTH	54 6	89 12	116 18	136 24	176 30	186 36	197 42	202 48				
WATER (PUBLIC)	1 PER MONTH	17 1	32 2	49 3	66 4	84 5	102 6	118 7	136 8				
WATER (SEMI PUBLIC)	2 PER MONTH	3 2	3 4	4 6	4 8	4 10	5 12	12 14	14 16				

CHART V—DERIVATION OF STANDARD

Milk:

10 examinations per 1,000 urban population
Urban population 7000
70 examinations for year
6 per month

Water:

Standard 1 examination per month
Rural:
1 examination per 1,000 rural population

A SUGGESTED MONTHLY CHECK SHEET

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NURSING SERVICE

ITEM	STANDARD	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
VISITS TO TYPHOID CASES	3 PER CASE	11/24	26/30	52/45	63/45	81/54	102/78	143/102	205/132				
TYPHOID INOCULATIONS	100 PER DEATH	27/200	192/200	293/200	616/200	663/200	980/300	1512/400	2051/600				
PRE-NATAL CASES	16 PER MONTH	24/16	43/32	65/48	90/54	110/80	125/96	152/112	164/128				
DELIVERIES IN HOSPITAL	7 PER MONTH	0/7	0/14	0/21	0/28	1/35	4/42	6/49	17/56				
VISITS TO INFANTS	88 PER MONTH	151/88	335/176	490/264	681/362	924/440	1071/528	1305/616	1598/704				
INFANTS TO MEDICAL CONFERENCE	150 PER MONTH	18/150	44/300	57/450	75/600	109/750	172/900	220/1050	290/1200				
SCHOOL EXAMINATIONS	150 PER MONTH	298/150	689/300	1337/450	1371/600	1401/750	1433/900	1501/1050	1608/1200				
PARENTS PRESENT	25%	16/75	22/172	40/334	40/317	40/350	40/358	40/375	85/402				
TEETH CLEANED	150 PER MONTH	17/150	35/300	70/450	87/600	90/750	90/900	91/1050	91/1200				

MEDICAL SERVICE

ITEM	STANDARD	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
TYPHOID CASES	7 PER DEATH	8/14	10/14	15/14	15/14	18/14	26/21	34/28	44/42				
TYPHOID INOCULATION	100 PER DEATH	27/200	192/200	293/200	616/200	663/200	980/300	1512/400	2051/600				
SMALLPOX VACCINATION	90 PER MONTH	51/90	317/180	535/270	682/360	706/450	738/540	777/630	934/720				
VENEREAL DISEASE CLINIC REGISTRATION	22 NEW PER MONTH	0/22	7/44	10/66	11/88	14/110	25/132	25/154	32/176				
VENEREAL DISEASE CLINIC VISITS	10 PER NEW PATIENT	14/0	70/70	112/100	144/110	199/140	233/250	256/250	305/320				
RAW MILK UNDER 50,000	95%	13/23	20/36	28/48	33/55	40/72	41/74	41/74	41/74				
INFANTS EXAMINED	150 PER MONTH	18/150	44/300	57/450	75/600	109/750	172/900	220/1050	290/1200				
SCHOOL CHILDREN EXAMINED	150 PER MONTH	298/150	689/300	1337/450	1371/600	1401/750	1433/900	1501/1050	1608/1200				
PARENTS PRESENT	25%	16/75	22/172	40/334	40/317	40/350	40/358	40/375	85/402				

CHARTS VI AND VII

Most of the items presented on these two charts have been presented on others. In Chart VI are illustrative items representing those activities in which a nursing service is

concerned; Chart VII those items essentially medical. These items are grouped in this way for the guidance of division heads responsible for special fields within the general program.

In the application and interpretation of this check sheet method one should be careful lest he follow too blindly. Should the administrator be certain that an apparent deficiency in one activity is offset by concentration upon another it would be unwise to shift the program emphasis merely to score. On the other hand it should be recognized that the standards reflect group judgment, which is more apt to maintain balance than is individual opinion.

To avoid confusion it is necessary to state that this check sheet method is not a product of the Committee on Administrative Practice, and that this committee is in no way responsible for its deficiencies. Consideration of this method of reporting should not be confused with the soundness or lack of soundness of the standards set forth in the *Appraisal Form for Rural Health Work*, nor with the accomplishments or deficiencies in that particular county whose figures are shown.

American Association for Medical Progress

THE American Association for Medical Progress, Inc., a national lay organization, with headquarters at 370 Seventh Avenue, New York, N. Y., during the year 1927 contributed articles, supplied educational material for exhibits, and conducted lectures on the relation of experimental science to human welfare. Two pamphlets explaining the contribution of science to the control of smallpox and diphtheria were issued and widely distributed along with other publications of the association. Although the association does not formally engage in research, it assembled a considerable amount of available data on smallpox vaccination laws, on the previous vaccinal condition of smallpox patients, on authenticated cases of disasters supposed to have resulted from the use of toxin-antitoxin, and on the availability of dogs for medical schools and for research, with special reference to legal limitations, legal recognition of research needs, and extra-legal arrangements that interfere with research. One of the better known activities of the association was its coöperation in establishing a voluntary fund for the purchase of a home for John R. Kissinger, the first private who offered himself for experimental exposure to yellow fever inoculation under Major Walter Reed in 1900. The purpose of the association, as stated in its annual report for 1927, is "to encourage experimental research for the advancement of medical science; to inform the public concerning the methods and discoveries responsible for man's increasing control over animal and human diseases."

An Intensive Newspaper Crusade for the Control of Cancer

GEORGE A. SOPER, PH. D., FELLOW, A. P. H. A.

American Society for the Control of Cancer, New York, N. Y.

AT a meeting in the spring of 1927 to stimulate interest in an organized campaign to raise an endowment fund of \$1,000,000 for the American Society for the Control of Cancer, a wish was expressed that a number of the addresses which were made by surgeons and research men could be printed in the daily papers. Out of this came the suggestion that the newspapers might print authoritative articles if a series could be produced which would be at once short, interesting, and informative.

To promote this idea a conference was held in New York City between prominent representatives of the publishers of the principal New York papers and of the American Society for the Control of Cancer.

A plan was evolved which called for sixteen articles on as many aspects of the cancer question. They were not signed but issued in the name of the American Society for the Control of Cancer. The articles were all to be carried under a suitable slogan. They were to be numbered and set up in two-column boxes. Each was to conclude with an announcement of the subject of the article which would appear on the following day. All the papers were to begin on a given date and proceed to print the bulletins in orderly sequence. One main idea was to run through the whole series and be stressed by reiteration and variation of expression: many cases of cancer can be cured if people will seek skillful medical attention upon the appearance of the earliest symptoms.

In due course the articles were written. Each was about 250 words in length and in all a tone of hopefulness was employed. The titles follow:

The Prevalence of Cancer
What Is Cancer?
The Danger Signals of Cancer
Is Cancer Hereditary?
Is Cancer Contagious?
The Family Doctor in Cancer
The Prevention of Cancer

The Surgical Treatment of Cancer
Cancer Clinics
Cancer Research
X-Rays and Radium in Cancer
The Warfare Against Cancer
The Curability of Cancer
Cancer Quacks

Following is an example of the bulletins showing the typographic set-up:

THE NEW IDEA OF CANCER
MANY CASES CAN BE CURED IF REPORTED PROMPTLY

Bulletin No. 5—New York Campaign
American Society for the Control of Cancer
25 West 43rd Street, New York City

IS CANCER CONTAGIOUS?

In spite of the fact that physicians and nurses have come into intimate *contact with cancer patients for so many years and taken no precautions against infecting themselves, there is no recorded instance of one case of cancer giving rise to another.*

This is not to say that microbes are never found in cancers. Discoveries are announced from time to time that bacteria have been identified with cancer, but upon full and impartial investigation it is always found that these parasites have been invaders of the cancer growth—followers rather than producers of the malignant condition.

Cancers often become infected with such microbes as infect wounds of any kind and the unpleasant odors which are sometimes associated with cancer are due to these accidental contaminations. Consequently, the precautions to be taken by those who come in contact with cancer patients are only such as should be followed with infected wounds.

There is no occasion to shun a person who has cancer, so far as danger of contracting the disease is concerned. The victims need all the sympathy and tenderness which can be shown them. Fear that cancer was contagious has sometimes led to unnecessary and uncharitable action toward the sick.

THE TIME TO CURE A CANCER IS WHEN IT IS BEGINNING

If you think you have any of the symptoms described in these articles you should be examined by your doctor or at a hospital at once.

Tomorrow's Article—"The Family Doctor in Cancer"

It was intended to print the bulletins in the spring, but the flight of Lindbergh to Europe took up so much of the space of the newspapers that by the advice of the publishers their appearance was postponed until fall.

It was expected that the publication of the bulletins would send many people to the hospitals. Accordingly, it became necessary to have the hospitals prepare to receive an unusual number of cancer cases and to make special provision for diagnoses.

It was also necessary to stage educational activities of various kinds in order to supply news which would give something for the papers to tie the bulletins up to, as the editors expressed it. They would be liberal in devoting space to cancer, but they must have news items to use in the preparation of their articles.

Inasmuch as the bulletins could not be printed until the autumn, opportunity was afforded to make careful plans for these features.

The postponement brought about a slackening of interest in the project, and it was thought necessary to do something to arouse the attention of the editors and publishers. Accordingly a letter was sent to each publisher in September informing him that during October Dr. George A. Soper, Managing Director of the American Society for the Control of Cancer, would make four addresses before medical societies in different parts of the country on topics which would be suitable for newspaper notice, and that abstracts of these addresses would be released in advance. The titles of these papers were:

Analysis of 1500 Applications for the Saunders Cancer Awards

The New Aspects of the Cancer Problem

What Official Public Health Agencies Should Do About Cancer

The Organized Movement for the Control of Cancer in America

Clippings subsequently received at headquarters showed that these addresses received considerable notice. When added together, the clippings amounted to 867 column inches.

The publishers were consulted on various subjects immediately before the bulletins were to be released, as, for example, the most favorable day for the appearance of the first bulletin, the suitability of the set up, and the order in which the bulletins should appear. It was hoped that in this way their interest would be further enlisted.

To give news support to the bulletins, the New York City Committee of the American Society for the Control of Cancer was requested to put on a period of intensive educational activity consisting of public meetings and other features of the society's cancer weeks. These "weeks" had long been familiar to other parts of the country but were new to New York City. The New York Committee was also asked to get the hospitals ready to handle the many persons who might apply for diagnosis and advice.

A series of articles was written to be released to the newspapers as news stories during the fortnight over which the bulletins would appear. These included the remarkable case of the "Wizard of Hicksville," a man who had courageously had a large part of his stomach removed because of cancer and had just opened a little machine shop in the village where he lived, and a report of advance information on cancer mortality, in which crude, adjusted and refined rates were given.

The New York City Committee brought about a number of public meetings, gave radio talks, and put up many posters and car cards. Reporters were referred by the national office of the society to the city committee for local news. It is in no small measure due to the coöperation afforded by the New York City Committee that so much space was given to the campaign by the metropolitan papers.

When all was ready, the printing of the bulletins was started. It

was expected that there might be a hitch and there were several. At the last moment one of the principal dailies reversed its decision to carry the bulletins. It refused to print any of them. The editors feared that their publication would do more harm than good—that the public would be unduly alarmed. Cancerphobia was as bad as cancer itself.

Here was a difficult situation. The newspaper in point was the most important of all. The refusal had been recommended by the editors and confirmed by the publisher. If this paper would not print the bulletins some or all of the other papers might also refuse to do so. On the other hand, if all the New York papers would go into the scheme, dailies and weeklies outside of New York might be induced to do the same.

An interview was obtained; the importance of the subject was explained; a slight change was proposed in one of the bulletins and reconsideration given to the whole subject. A decision was reached on the part of the publisher not only to print the bulletins but to give a column of news space a day to the subject of cancer as long as the bulletins were being printed. The way in which this final decision was carried out is above all praise. Not only was much space given to the subject in the news columns of this paper, but in addition several excellent editorials were printed. The paper was the *New York Times*.

Disaster threatened in another direction. On the eve of the appearance of the first bulletin, several morning papers raised the objection that they could not reprint bulletins if they were first to appear in the previous evening papers. The evening papers refused to reprint bulletins which were first carried by the morning papers. Each set of newspapers was willing to print the bulletins on the same day that others published them, but no paper would publish anything which had already appeared.

There was only one thing to do. A second set of sixteen bulletins had to be hurriedly prepared. The new set was much like the first one as to topics and their order but had a different slogan and was different in composition. This solved the difficulty.

There were some minor hitches, but by diligent use of the telephone they were overcome. One by one the newspapers got into line after the four principal ones led off. By the end of the first week nine of the city papers were printing the bulletins.

When practically every newspaper in New York City was carrying the bulletins, the idea was taken to the whole country. Copies were sent to the society's state chairmen with a request that they send the bulletins to the newspapers in their territory asking the publishers as a personal favor to publish them. They could point to what was being

done in the City of New York as an argument. Prominent people in various occupations were urged to write to the publishers expressing interest in the matter. Bulletins were also sent direct to newspapers.

The response was gratifying. Newspapers, and sometimes syndicates of newspapers, took up the bulletins and printed them. The movement gained impetus as it proceeded. Dates of release were disregarded to the extent that previous publication in New York City or elsewhere was not considered a bar. More and more papers carried the bulletins each day. Messages arrived at headquarters requesting sets of the bulletins for the use of papers which had inadvertently been omitted from the list of those to whom sets had been sent. Some publishers were offended at having been left out.

It is impossible at this writing to state how many papers printed the bulletins. There are many periodicals which appear once a week which are still joining the movement, and there are a great many little newspapers which will follow the example of the big ones.

Up to March 1, 507 papers were known to have carried or to be carrying the bulletins. These newspapers were distributed in 43 states. All of these papers except the New York City morning papers were carrying the series originally prepared. The aggregate circulation cannot be given, as all returns have not been received at headquarters, but it is known to be well over 10,400,000.

Advertisers and others estimate that the number of readers for each paper varies from 3 to 5. The number who read a given paper depends upon the paper itself, the part of the country in which it is published, whether it is a morning or evening issue, and whether it is delivered at the home or bought at a stand. Allowing 4 readers for each paper, the total number of persons into whose hands these bulletins have been placed has been, roundly, 42,000,000 a day. It is to be remembered that this distribution has taken place not only on one day but on sixteen days.

The value of this publicity cannot be estimated in terms of money, nor in any other way, but a few remarks upon its practical utility may be of interest. During these two weeks probably as many people were instructed in the society's doctrine as had been reached through all channels during any period of five years of the society's career. This instruction had the advantage of being given directly by the national office to the persons for whom it was intended and not through the interpretative voice of a lecturer or other intermediary. The lesson had the value of reiteration. The instruction was exactly in the direction followed by the society from its organization fourteen years ago; namely, the public was told the danger signals of cancer and advised

to go to a physician or hospital for examination upon the first appearance of symptoms or, in fact, a suspicion that cancer might be present.

That many people have been frightened into going to the doctors and hospitals, there is no doubt. Nor is it to be doubted that lives have been saved thereby. The intention has been not to alarm people unduly, but just enough to cause them to have a proper regard for their safety so that they will take the necessary steps for their protection.

Hundreds of people telephoned or called or wrote letters to the office of the American Society for the Control of Cancer asking for further information. Many inquirers wanted to know where to go for examination. A list of 46 hospitals with their addresses and clinic hours had been prepared in advance for such persons and these were given out on request. The hospitals had been requested to be ready for the patients who might come to them. Nobody was sent to any one doctor or hospital. The society did not make any diagnoses or give medical advice suited only to particular cases; much less did it, or does it ever treat cases. Questions on every conceivable aspect of the cancer problem poured in. Provision had been made to answer all inquiries promptly and fully.

There were very few editorials. This feature was not especially promoted in connection with the scheme, this being thought to be unnecessary. It was mistakenly supposed that the editorial page would back up the news pages by recommending the bulletins and their teachings to the sensible attention of the readers.

The hospitals all reported an unusual number of persons applying for examination for cancer. It is believed that not a few persons appeared in an early enough stage in the disease to permit of cure.

On the day when the last bulletin of the series was published in the New York City papers a letter was received by the society from a well known firm of lawyers asking for the full legal name of the American Society for the Control of Cancer, explaining that because of the recent newspaper crusade a client had decided to change his will so as to leave the society a legacy of \$50,000.

The preparation of the bulletins, the contacts with the newspapers, and the large amount of correspondence involved were all attended to by the society's regular staff. There was no publicity expert employed and no extra help of any kind engaged upon this work.

The newspaper space known to have been given to the bulletins and their supporting news releases was as follows:

Addresses by Dr. Soper, 867 column inches; daily bulletins, 30,560 column inches; news, 2,425 column inches; totalling in all 33,852 column inches.

Hunting the Vitamin*

WALTER H. EDDY, PH. D.

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AN OUTSTANDING event of 1926-27 in vitamin research has been the ^{elucidation} ~~elucidation~~ of complexity in what we have been wont to designate as Vitamin B or, in Funk's nomenclature, the antineuritic vitamin. Smith and Hendrick¹ in this country probably first produced satisfactory evidence of at least the duality of the complex though Emmett and others had some years before noted the possibility. Goldberger and his coworkers² have extended these studies of Smith and Hendrick and shown that one of the vitamin B factors is relatively heat stable, non-antineuritic but definitely antipellagric. This viewpoint has been confirmed by other workers in both this country and in Europe.

From Java also comes this year the announcement of the isolation of the antineuritic factor in crystalline form, reported by Jansen and Donath.³

It is then at least evident that what we have called vitamin B consists of two vitamins and that these factors are distributed in food sources of the vitamin in differing proportion. A food in other words may be a good antineuritic and a poor antipellagric or *vice versa*. It is however still far from certain that what we have called vitamin B is merely dual in nature. The data already obtained however strongly emphasizes the need of chemical fractionation of these factors if we are to learn their rôle in diet and health.

During the past seven years R. R. Williams has actively coöperated with my laboratory in the study of vitamin B fractionation. Independently and in collaboration he has accumulated a vast amount of data involving over 1000 pigeon feeding tests and many rat feeding tests. The detail of this experimentation has an important bearing on both the chemistry and physiology of vitamin B factors and will soon appear in print.

Dr. Ralph Kerr, who developed with Williams and myself the isolation of a crystalline bios (bios 223), has during the past year separated from yeast another substance of chemical homogeneity and

* Read before the Food and Drugs Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 19, 1927.

while his work has not yet reached the point of complete purification of the substance or of chemical designation comparable to what exists for bios 223, the new product (beta bios) is quite different from the first and apparently of greater growth stimulating power.

In a sabbatical leave tour of France and England during the first of this year, I had the opportunity of personally observing the methods and results of Randoin, Besszonof, Drummond, Chick and Peters and other workers in the field.

In view of the above it has seemed to me not out of place also to review some of the data now existent concerning the vitamin B complex and especially the work of my own laboratory as it relates to work of other laboratories now studying this problem from the chemical angle.

At the Lister Institute in London, in May, 1927, Dr. Harriet Chick, in collaboration with Miss Roscoe had obtained data apparently fully confirming Goldberger's contention that the yeast vitamin B is composed of an antineuritic factor and an antipellagric factor. Her work makes clear that both of these factors are necessary for continuous growth in rats and that the antipellagric factor is more heat stable than is the factor which prevents or cures polyneuritis, but it is both misleading and contrary to fact to designate the antipellagric as the growth factor in contradistinction to the antineuritic factor, for so far as her experiments go they show that the rat will decline and die unless both factors are present in suitable proportions. Her studies also show that wheat embryo is much richer in the antineuritic factor than in the antipellagric one, thus putting wheat in the same category as corn in this respect.

It may be recalled here that Goldberger's success in demonstrating the P-P factor (his designation for the antipellagric) lay in his utilization of an alcoholic extract of cornmeal which, like Chick's alcohol extract of wheat embryo, proved relatively poor in P-P but rich in antineuritic. Chick's experiments are however in a way still more conclusive owing to her possessing a source of antineuritic *practically devoid of P-P*. This she owed to the success of Kinnersley and Peters of the Oxford University Department of Biochemistry. In this country we have known for some time that by autoclaving yeast at 120° C. we can destroy its heat labile polyneuritis preventing power without loss of its more heat stable P-P factor. We have however lacked a preparation that was rich in antineuritic but entirely devoid of P-P. Kinnersley and Peters's "torulin" yeast fraction therefore particularly interested me. Their preliminary method has already appeared in print but Peters has since greatly refined this method and has kindly provided me with details of his present method including his manner of con-

trolling the selective adsorptive power of norite for the antineuritic factor. His present method is briefly summarized below:

SUMMARY OF PETERS AND KINNERSLEY'S PRESENT METHOD OF OBTAINING "TORULIN"

1. Extract partly autolyzed baker's yeast with boiling water. Filter.
2. Treat filtrates with 25 per cent neutral lead acetate. Filter.
3. Treat with baryta to remove gum. Filter and make acid to Congo red with sulfuric.
4. Remove baryta with sulfuric acid. Filter. Make solution pH 2.5.
5. Add mercuric sulfate in sulfuric acid. Filter.
6. Make filtrate pH 7. Add dry purified norite. Filter after 10 minutes' stirring.
7. Re-treat filtrates with additional norite to complete removal of torulin at pH 7.
8. Extract torulin from norite with N/10 HCl on hot water bath.
9. Purify torulin by alcoholic fractionation method after the manner of Osborne-Wakemann.

My interest in this "torulin" fraction and Chick's use of it was further stimulated on my return from Europe by finding that my colleague Williams had in my absence also succeeded in accomplishing a fractionation of the more heat labile part of vitamin B by refinements in the control of the adsorbing power of fuller's earth. Almost coincident with these developments came the announcement by Jansen and Donath of the isolation of a crystalline antineuritic of high potency.

Are Peters's "torulin," Williams's specifically activated fuller's earths, and Jansen and Donath's crystalline antineuritic, identical in character? Unfortunately data are not yet available to settle this point. Peters tells me that he has been unable to make Jansen and Donath's method produce a product such as they describe when he has applied it to his norite fraction. Since however, the method of Jansen and Donath was applied to rice polish extract, Peters's failure may be due to interference with the method by substances present in yeast and absent in rice polish. Peters has also confined his tests for potency to measurements of dosage necessary to cure pigeons sick of polyneuritis in a given time period. He has, so far as I can learn,⁵ reported only two observations on the weight restoration or weight-maintaining power of his torulin fraction and in these two cases the birds were cured of polyneuritic symptoms but continued to decline in weight. Jansen and Donath report only a few observations on pigeon weights but imply that their fraction not only cured polyneuritis but also prevented weight loss.

The properties of Williams's preparations⁶ are presented in the accompanying Chart I, and will be described much more in detail in his own report of these findings. His preparations used in preventive

TO SHOW THE SPECIFICITY OF WILLIAMS'S PREPARATIONS WHEN USED IN TESTS
WITH PIGEONS

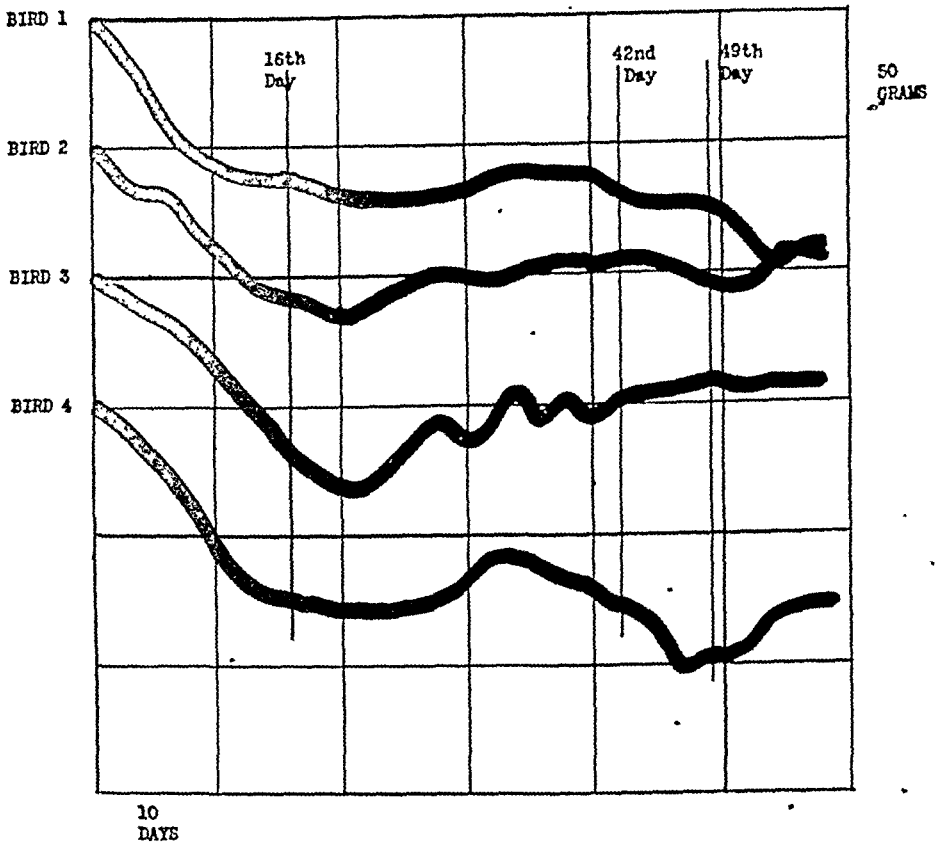


CHART I—Four adult pigeons were fed on polished rice alone until the 16th day. On the 16th day each bird received 5 mg. of Williams's preparation Y1 and this dosage was continued daily up to the 42nd day. The birds ceased to decline in weight and showed no polynuritis but failed to return to normal weight. On the 42nd day the dose of Y1 was quadrupled (20 mg. daily) and on the 49th day quadrupled again (80 mg. daily). These increases failed to appreciably restore weight. Addition of autoclaved yeast on the 58th day also failed to restore weight but the birds promptly recovered when fed whole grain or whole dried yeast. Pigeons therefore require what is in Y1 to protect from polynuritis and to maintain weight but Y1 lacks a factor present in whole yeast and in autoclaved yeast which the pigeon needs. Is this vitamin B3? The heavy line in the chart is the growth curve.

tests uniformly exert some power toward the restoration of weight or at least to maintaining of weight at a lower level than normal, but in no case or dosage yet tested are they capable of bringing the birds back to the weight they had before the polished rice feeding began. With rats Williams's preparation produces, when used as the sole source of vitamin B in an otherwise adequate diet, a slight amount of growth. Autoclaved yeast alone also stimulates growth at first but a growth that is soon arrested and followed by death from polynuritis. By combining the Williams preparation with an adequate supply of autoclaved yeast

normal rat growth is obtained. It prevents polyneuritis in both rats and pigeons in doses as low as 5 mg. of activated earth per day.

Chick's work shows that Peters's extract resembles Williams's fraction when supplied to rats, i.e., it is lacking in the heat stabile factor of autoclaved yeast. Seidell's experiments and ours make it doubtful whether the P-P factor of autoclaved yeast is required by pigeons. To date it has been found impossible to restore birds to normal weight by adding autoclaved yeast to the Williams factor in pigeon feeding. Hence in the lack of further data from Peters we know only that his torulin fraction behaves like Williams's fraction toward rats but not that it is identical in bird affecting values. In brief, it is still a question whether the heat labile factors required by pigeons are one or two; whether the vitamin B complex of yeast is composed of two heat labile and one relatively heat stabile* factor, one of each or several of each.

Significant then as are these fractionations in the matter of solving the problem of what vitamin B is, that problem still exists. There is neither time nor place here for further discussion of these points. It will however be immediately evident to the public health worker or dietary adviser that we must have a complete revision of our tests and data on the distribution of vitamin B in foodstuffs and that the preparations described above are going to be valuable tools in this work. Previous tests have taught us the amounts of food considered as source of vitamin B necessary to normal or subnormal rat growth or to pigeon health, but not their antineuritic versus their antipellagric content. I wish then to consider next some of our preliminary work in approaching this problem of differentiating the vitamin fractions.

A year ago I reported to this Association a series of experiments devised to show the vitamin value of the banana.⁶ In that report I showed that by the Sherman rat test 8-10 g. of ripe banana per day per rat was necessary to prevent polyneuritis and secure a growth of 20 g. gain in 60 days using 30-day old white rats as test animals. How much antineuritic and how much antipellagric vitamin is present in this quantity of banana? Obviously the gross test of last year shows that both factors are present in banana but fails to differentiate them. With the aid of Williams's preparations and autoclaved yeast we now have tools that enable us to do this. Chart II summarizes the feeding tests to date. In brief, if the antineuritic factor is supplied by an adequate source such as Williams's preparation which is at the same time free of

* It will be noted that we are careful to describe the P-P factor as relatively heat stabile. Ordinary autoclaving of yeast adequate to destruction of its polyneuritis preventing power leaves the yeast antipellagric. An accident in allowing the autoclaving to proceed for a longer time demonstrated that under these conditions the antipellagric power will also disappear. P-P is then capable of heat destruction but far more resistant to it than is the antineuritic fraction.

TO SHOW THE SPECIFICITY OF WILLIAMS'S PREPARATIONS WHEN USED IN TESTS WITH WHITE RATS

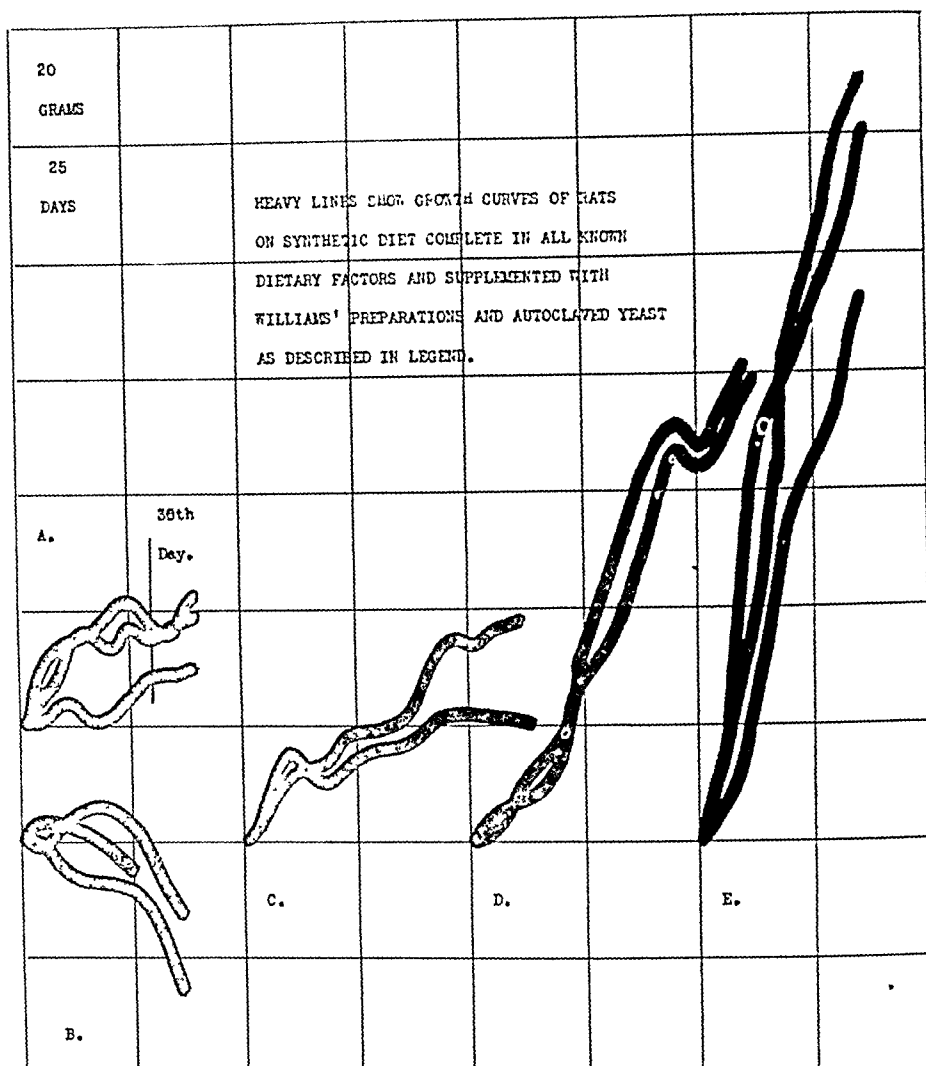


CHART II—A. Three rats 30 days of age were fed on a vitamin B-free basal diet plus 10 mg. Williams's preparation Y1 daily. On the 30th day the Y1 was quadrupled (40 mg.). A slight temporary gain was not maintained but no symptoms of polyneuritis appeared. Y1 then protects rats from polyneuritis, permits some weight gain but is not adequate for normal growth. B, C, D, E. These four groups of 30-day old rats were fed as follows: Group B received the same basal diet as Group A, plus 1 g. of autoclaved yeast daily. They received no Williams's preparation. They declined in weight and died of acute polyneuritis in 25–40 days. Groups C, D, and E received the same basal diet and autoclaved yeast dosage as Group B. In addition Group C received 3 mg. Williams's Y1 daily, Group D received 6 mg. Y1 daily and Group E 10 mg. Y1 daily. When the rat receives his antipellagic factor in the form of autoclaved yeast and his antineuritic factor in the form of Williams's preparation normal growth results. He apparently needs only vitamins B1 and B2 and does not require the factor B3 essential to the pigeon.

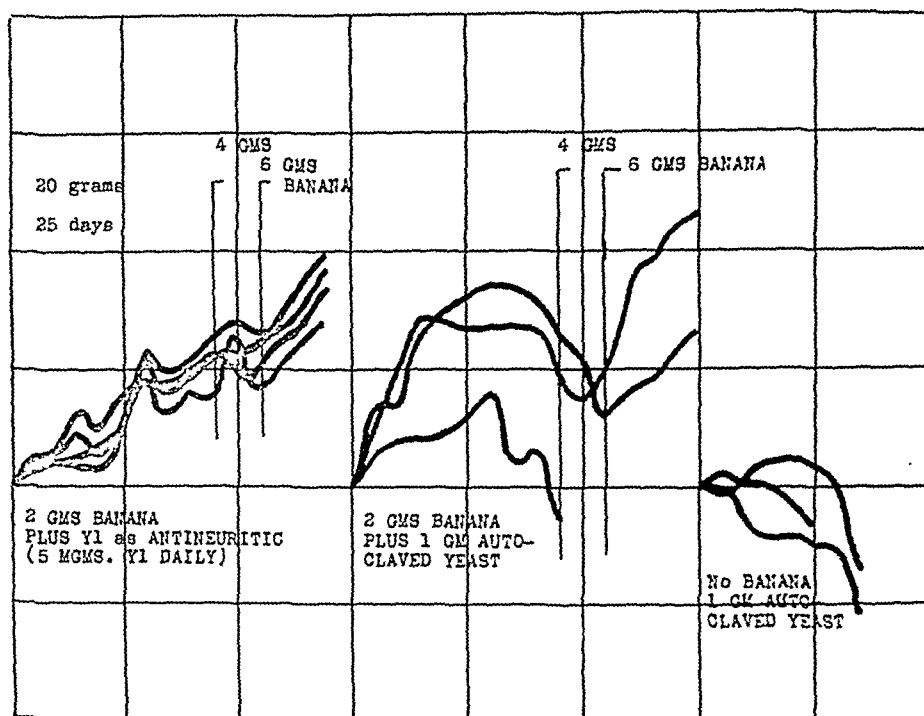
P-P, even 2 g. of banana per rat per day supplies enough of the latter factor to produce better than 20 g. gain in 60 days and 6 g. of banana furnishes enough P-P for nearly normal growth curves. The banana should then be a good antipellagic. On the other hand, if P-P is supplied by autoclaved yeast devoid of antineuritic, rats fail to show an upward growth trend until at least 6 g. per day of banana is added to supply antineuritic. The differentiation of vitamin B in a fruit such as the banana then seems to indicate a better content of antipellagic than of antineuritic. Does this hold true of other fruits? Tests of course will be our only means to the answer, but the tools are now available for the tests.

We have as yet had time to test only one other foodstuff by this method. In our study of the distribution of vitamins in canned spinach, Kohman and I¹ reported some time ago certain observations on its vitamin B content. At the time we noted a marked difference in the behavior of dried raw spinach and dried cooked spinach as a source of vitamin B with an apparent lessened potency of the latter. We did find however that the canned was as good as the home cooked in this respect. In carrying our control experiments we made the discovery that if a rat received *one-third* of his vitamin B requirement in the form of dried yeast, he not only was able to use dried cooked spinach to meet the other two-thirds requirement, but would readily eat enough to bring about this result. We felt at the time that the yeast was a means of stimulating the appetite of the rat for spinach rather than that the spinach was lacking in B. We did however record at the time one experiment of Williams with our dried cooked spinach in which he was unable to prevent polyneuritis in pigeons with a daily dosage of 4.4 g.

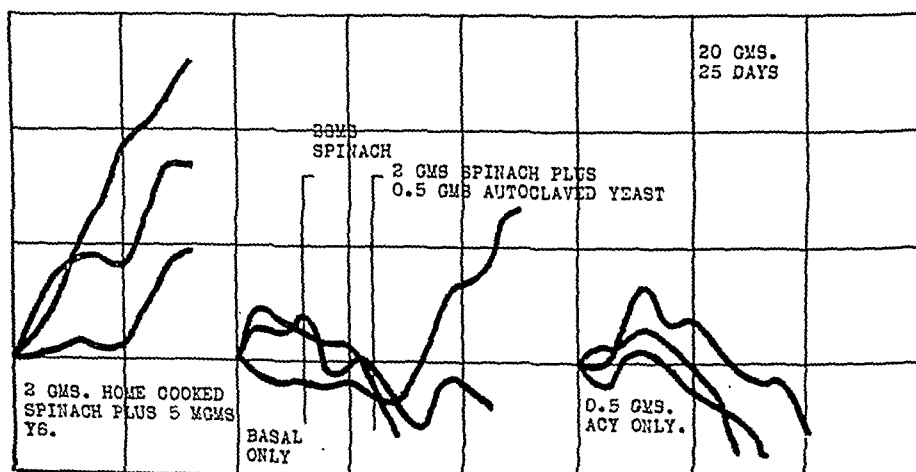
Pigeon and rat testers have frequently reported similar discrepancies in studies of vegetable and fruit sources of vitamin B. We have therefore, as in the case of the banana, begun a series of tests of the vitamin B value of spinach using similar methods and utilizing autoclaved yeast and the Williams preparations in tests. Chart II shows data obtained to date using undried home cooked spinach in this series. Again we find that while the spinach is not devoid of either factor, it is a much better source of the antipellagic than of the antineuritic, and that cooking tends to reduce its antineuritic value.

The purpose of this paper is primarily to show the importance of chemical fractionation methods in progress toward the solution of problems of vitamin behavior. Perhaps these two illustrations have adequately indicated how hunting the vitamin B fractions has been a step toward better dietetic advice and a means to further progress in that line. Since, however, we are not at all sure as yet as to how many

APPLICATION OF WILLIAMS'S PREPARATIONS TO VITAMIN B TESTS ON FOODSTUFFS



TESTS ON RIPE BANANA SHOWING IT TO BE A BETTER ANTIPPELLAGRIC THAN AN ANTINEURITIC
THOUGH CONTAINING BOTH FACTORS



TESTS ON UNDRIED HOME COOKED SPINACH SHOWING IT TO BE A MUCH BETTER ANTIPPELLAGRIC
THAN ANTINEURITIC

CHART III—Since the Williams's preparation Y1 supplies the rat with antineuritic factor only and the autoclaved yeast with antipellagic factor only it is possible with these two substances to determine quantitatively the amount of each kind of factor present in a food stuff. Chart III shows how these factors were used to show that both banana and spinach are richer in antipellagic than antineuritic factor. By giving the rat in combination with an otherwise adequate basal diet enough of either factor to meet his need for that, the value of a foodstuff as supply of the missing factor is measurable.

vitamins B exist, it is perhaps well to emphasize both their value and limitations. The latter consideration gives point to the urge to greater activity in the field of chemical isolation and before closing this paper I wish to report briefly certain other chemical phases of our vitamin hunt attained during the past year.

Sir James Irvine recently put his reasons for interest in the study of carbohydrates as follows:

My reflections have convinced me that first importance must be attached to the fact that carbohydrates are essentially the products of natural, as opposed to artificial, synthesis. Within us and around us, through the agency of life, these compounds are being built up and broken down, formed and transformed, finally to be consumed in the fire of metabolism. To study the sugars is, in brief, to study the great molecular channel through which solar energy flows to us. No wonder that the thought of such work makes a powerful appeal to the student of vitalism who is naturally somewhat inclined to turn aside from that aspect of chemistry which deals with purely artificial reactions.

The study of yeast behavior and the factors that control it has for a somewhat similar reason to that advanced by Irvine, always interested the biochemist. The postulation of bioses that function in stimulating yeast growth, much as vitamins stimulate the growth of higher organisms, has held out the hope that by isolation and observation of the behavior of these bioses we might obtain more easily the clue to the method of activity of the vitamins even though, as now seems evident, such bioses do not appear to be of importance in animal nutrition.

Three years ago Kerr, Williams and I⁸ succeeded in isolating from yeast a crystalline amino acid that seemed to function as a bios. A later discovery was the fact⁹ that the activity of this compound could be completely blocked by substituting for one of its NH_2 hydrogens an additional compound (benzene sulfon chloride) and that this inactive compound became active again when the substituted product was removed and the hydrogen restored by hydrolysis. Such studies seemed to be bringing our hunt closer to localizing the seat of activity of these compounds. However, a series of events has postponed for the time our pursuit of the study of bios 223.

By following our method exactly Roger Williams¹⁰ was able to separate from yeast our crystalline bios or at least a product with the same physical and chemical constants. When he tested the activity of this product on the yeast at his command he reported two results of significance, viz., that the isolated amino acid is not so active as the yeast autolysate from which it is separated and that its stimulative power is confined to certain strains of yeast. His findings are given in part in Table I.

TABLE I

ROGER WILLIAMS'S RESULTS WITH BIOS 223 TESTS

I. 24 hours incubation at 31° C.		II. 48 hours incubation at 31° C.	
Test	Yeast crop in mg.	Test	Yeast crop in mg.
Control (no bios)	1.0	Control (no bios)	1.7
10 mg. yeast autol	2.1	1 mg. bios	2.7
0.5 mg. bios	1.4	1 mg. bios	2.9
0.2 mg. bios	1.6	10 mg. cane molasses	3.3
0.06 mg. bios	1.3	20 mg. cane molasses	4.1

Meanwhile, unaware of Williams's results at the time, our own tests had revealed similar peculiarities as well as other data of interest in the matter of bios behavior. Some of these data are given in Table II.

The results showed conclusively that our bios 223 isolated from yeast autolysate either was not the sole bios or lacked some factor left in the yeast to attain maximum stimulation. The results also strongly suggest that these bioses are not growth catalysts but true yeast foods, the stimulation being directly proportional to the amount of bios present. In view of these results it seemed best to turn for the moment from the study of structure of bios 223 and hunt for another bios in the yeast autolysate. That search has been successful and will shortly be reported in detail by Dr. Kerr. The following brief summary will show how the new product (beta bios) was obtained and in Table III are given a series of comparisons between its behavior as a growth stimulus and bios 223. Chemical analysis indicates homogeneity in fractions obtained by duplication of the isolation method and certain indications as to its structural composition are now available, but it is unlike bios 223 in being very hygroscopic, and we have not yet suc-

TABLE II

SOME OF KERR AND EDDY'S TESTS WITH BIOS 223

Series I. Using 0.1 c.c. yeast autolysate per 10 c.c. Clark's medium					Series II. Using 0.1 mg. bios 223 per c.c. of Clark's medium			
Seedings		A		B		C		D
Controls	Yeast tube	Controls	Yeast tube	Controls	Old Bios	Controls	Fresh made bios	
c.c.	c.c.	c.c.	c.c.	c.c.	c.c.	c.c.	c.c.	c.c.
0.1	.001	.068	.002	.075	.001	.003	.002	.019
0.2	.004	.067	.004	.081	.004	.006	.006	.022
0.3	.005	.062	.007	.076	.007	.008	.009	.018
0.4	.007	.061	.009	.069	.008	.009	.010	.019
0.5	.008	.065	.009	.073	.009	.010	.010	.018
0.6	.009	.068	.010	.076	.010	.010	.011	.020
0.7	.010	.063	.011	.077	.010	.014	.011	.019
0.8	.011	.064	.012	.068	.011	.013	.011	.017
0.9	.011	.065	.012	.076	.012	.013	.013	.012
1.0	.011	.068	.012	.079	.011	.014	.016	.020

Incubation 48 hours at 31° C. One c.c. seeding means 250,000 cells per c.c.
Results in volumes c.c. per Hopkins tubes after Funk-Dubin method.

ceeded in getting it in crystalline form. Like bios 223, it contains both amino and carboxyl groups.

TABLE III

TABLE SHOWING COMPARATIVE ACTIVITIES OF ALPHA AND BETA BIOSSES

Dosage: 0.001 mg. Bioses per c.c. of Roger Williams's culture medium.

Seeding in each case 250000 cells per 10 c.c. medium.

Growth reported in volumes of centrifuged cells after Funk-Dubin method.

Incubation at 31° C. in still tubes.

A. Tests applied to Gebrüde Mayer Yeast (supplied by Fleischmann Co.)

Results at end of	24 hrs.	48 hrs.	72 hrs.
	c.c.	c.c.	c.c.
Control (no bios)	.001	.002	.017
Control (no bios)	.002	.002	.012
Alpha-Bios	.003	.011	.024
Alpha-Bios	.002	.010	.020
Beta-Bios	.008	.013	.031
Beta-Bios	.009	.012	.031

B. Tests applied to Ruppert Brewing yeast (supplied by Ruppert Brewing Co.)

Results at end of	24 hrs.	48 hrs.	72 hrs.
	c.c.	c.c.	c.c.
Control (no bios)	.001	.002	.001
Control (no bios)	.001	.002	.002
Alpha-Bios	.003	.014	.013
Alpha-Bios	.002	.015	.012
Beta-Bios	.002	.017	.019
Beta-Bios	.004	.019	.020

C. Tests applied to Untergarige Hefe K (supplied by Fleischmann Co.)

Results at end of	24 hrs.	48 hrs.	72 hrs.
	c.c.	c.c.	c.c.
Control (no bios)	.001	.002	.002
Control (no bios)	.002	.003	.002
Alpha-Bios	.003	.010	.011
Alpha-Bios	.004	.012	.010
Beta-Bios	.009	.015	.013
Beta-Bios	.004	.018	.016

BRIEF RECAPITULATION OF KERR'S PRESENT METHOD OF SEPARATING ALPHA AND BETA BIOS FROM YEAST AUTOLYSATE

I. Preparation of extract which contains both bioses:

- Autolyse brewer's yeast 3 days at room temperature. Filter.
- Dilute with equal volume of water and refilter.
- Heat filtrate to boiling and discard unfilterable matter.
- Stir with 50 g. fuller's earth per l. (750 g. per extract 100 lbs. moist yeast.) This process removes the vitamin B and takes out little bios.
- Make filtrate pH 4.7 and stir with iron sol. Discard ppt.
- Make filtrate pH 5.3 and use double amount of iron sol. used above. At this pH the iron sol. in suitable quantity removes both bioses. Adsorption complete if stirred and then allowed to stand 30 minutes before filtering. Activated iron sol. further purified by mixing with water, stirring and again filtering.
- Obtain bioses from iron sol. by first drying the latter. While still pasty add as little as possible of 30 per cent sulfuric acid. When solution is

nearly complete, dilute with water until sulfuric acid content is not over 5 per cent. Remove iron and sulfate ion with baryta at pH 7. Filter only at this pH. Beta bios is lost if filtered at alkaline reaction.

II. Separation of the bioses from the above extract:

- a. Remove baryta with sulfuric acid and concentrate at 50° to sirupy consistency. Add 95 per cent alcohol and satt. baryta (hot) until alcohol content is 70 per cent and no more baryta gum flocks out. Let ppt. settle. Decant and filter the supernatant fluid. The precipitate now contains the beta bios. The filtrate contains the alpha bios (bios 223).

III. Purification of beta bios:

- a. Stir ppt. with water and filter. Repeat until water filtrate is colorless.
- b. Neutralize filtrates as rapidly as possible with sulfuric and combine.
- c. Make combined filtrates pH 5-6 and filter.
- d. Add hot water solution of silver sulfate and reject ppt.
- e. Add acid mercuric sulfate to filtrate and reject ppt.
- f. Evaporate extract from 100 lbs. yeast to 100 c.c. Add sulfuric to 5 per cent by wt. Precipitate with 20 per cent phosphotungstic acid in 5 per cent sulfuric. Let stand over night and filter. Save ppt. Discard filtrate.
- g. Decompose the phosphotungstic ppt. as follows:
Dissolve ppt. in as little 80 per cent acetone as possible and add cold 1/3 satt. baryta. When the mixture is free of soluble phosphotungstate evaporate with constant stirring and air blast until free of acetone. Filter and discard ppt. Remove barium quantitatively with sulfuric and concentrate filtrate to sirup by fanning at 30° C. (Compound is very thermo-labile.) Do not attempt to carry this to dryness. Dry the product by stirring in large quantities of acetone until the residue becomes a dry granular yellow powder. Filter the acetone suspension by suction until the last free acetone disappears from the top of the ppt. While the residue is still moist with acetone transfer to a cool dry container and place immediately in vacuum desiccator over fresh sulfuric acid. Remove last traces of acetone suction. Light yellow semi-crystalline powder is beta-bios.

Are there other bioses in yeast? Are these two products similar in function? Are they related in any way in origin? Do they exist in yeast as separate entities or are they parts of a larger molecule split by our fractionation? These and other questions at once arise but the success of the hunt in bringing to light another homogeneous complex of growth stimulating activity has at least multiplied our tools for the study of the chemistry of growth stimulation and perhaps justified delay in the solution of structural problems raised by bios 223 isolation.

I believe that the explanation of the rôle of factors such as vitamins and bioses in nutrition can come only with chemical isolation and perhaps synthesis of the active substances. I feel that the past year has provided distinct encouragement that such isolation is possible, and that we merely await with further patience the refinement of existing procedures to attain the goal. I might have cited equally notable advances in this direction in the study of other vitamins by other

workers. However, in adhering to the rule of the Association that the paper shall deal with original work I have confined my review as much as possible to the developments in my own laboratory with such reference to other work in the field as relates to it.

The significance of this and other work on vitamin structure and behavior perhaps needs no further words of interpretation to workers in public health fields. The true student of the science of nutrition, however, often appears to a disadvantage in the rôle of adviser on dietetic problems due to his consciousness of unsolved problems, an inhibition entirely lacking in the dogmatic food faddist. Perhaps then it is permissible to emphasize a bit the need of such inhibitions and the problems that still exist unsolved to encourage the public health worker to continue to be cautious rather than dogmatic in his advice.

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Paris Has New Type of Open Air School.

A NEW type of open-air school, sponsored by Prof. Alfred Binet, co-inventor of the Binet-Simon Intelligence test, has been opened recently in a thickly populated district of Paris.

The purpose of this school is to provide instruction for each child not according to his age, but according to his physical and mental abilities. Each pupil is examined by a physician at the time of admission; is given a Binet-Simon test; and is then assigned to a grade in accordance with the findings of the examination. The examination is repeated every 3 months, and the child is promoted to a higher grade or left in the same, according to the findings.—*La Pediatria*, Naples, Oct. 15, 1927. p. xxvii.

The School Ventilation Study in Syracuse, N. Y.*

School Year, 1926-1927

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DURING the school year 1926-27, the Commission conducted a preliminary study into the effect of ventilation on the health of school children in three modern, steam heated, mechanically ventilated schools and in three old, furnace heated, naturally ventilated schools. The incidence and duration of diseases of the upper respiratory tracts of the pupils were taken as the criterion for judging the relative healthfulness of the two types of ventilation under consideration, but in actual practice in this preliminary study, in which the determination of the presence or absence of these diseases rested largely with the parents and teachers, the medical terminology was discarded and the diagnoses were interpreted under the general headings: colds or sore throats.

The crude results of this study support, in general, the findings of the Commission's studies in certain schools of New York City some ten years earlier.¹ The mechanically ventilated schools showed an excess of 47 per cent in total absenteeism; of 67 per cent in absenteeism due to respiratory illness; of 80 per cent in respiratory illness among the pupils present, and of 77 per cent in the total of respiratory illness among pupils present and absent.

This apparently decisive confirmation of the Commission's earlier studies might be accepted as the final and definite answer to the question of the relative superiority of natural over mechanical systems of ventilation. But, just as it has been so frequently shown that *crude* death rates are not reliable indices of the relative healthfulness of two communities, so it may be shown that in these schools the *crude* rates of total absenteeism and that part of it due to respiratory illness are not to be relied upon as an infallible guide in determining which of two types of ventilation is the more healthful—and the reasons in the two cases are much the same!

* Abstract of report, delivered before the American Society of Heating and Ventilating Engineers at their Annual Meeting, January 24, 1928. The complete report under the title of "Effect of Ventilation on the Health of School Children," will be published in the *Journal of the American Society of Heating and Ventilating Engineers*, April, 1928.

Communities differ in the age, sex and racial compositions of their populations, and school populations differ in the same manner. It is only after mortality rates are corrected for residence and the differences of age and sex are compensated by "standardization" or adjustment to a standard population, that one may safely take even the first steps in deciding which of two communities is the more healthful. Furthermore, judgment should not rest on the experience of a single year. The same precautions hold in the judgment of the healthfulness of methods of school ventilation.

Certain characteristics of the populations of the six schools included in this preliminary study are shown in Table I.

TABLE I
CHARACTERISTICS OF SCHOOL POPULATIONS

School	Grades	No. of Pupils	Percentage of Pupils of American Parentage	Average Age of Pupils (Years)	Percentage Males
<i>Mechanically Ventilated Schools</i>					
Salem Hyde	2-5	146	91.8	8.3	56.2
Seymour	2-8	707	62.0	11.1	50.6
Danforth	2-6	379	85.5	9.5	47.8
Totals		1232	72.7	10.3	50.4
<i>Naturally Ventilated Schools</i>					
Montgomery	2-6	325	65.0	9.9	50.5
Merrick	2-6	232	91.4	8.9	51.3
Townsend	2-3	237	4.6	8.2	53.2
Totals		794	54.6	9.1	51.5

The mean temperature of the air in the classrooms and the attendance and health records of the different schools are given in Table II.

TABLE II
MEAN TEMPERATURES, ATTENDANCE AND HEALTH RECORDS

School	Mean Temp. (°F)	Total* Absences	Absences Due to Resp. Ill.*	Resp. Dis. Among Pupils Present*	Total Respiratory Disease*
<i>Mechanically Ventilated Schools</i>					
Salem Hyde	70.2	6.4	3.4	20.4	23.8
Seymour	70.1	7.7	2.6	13.6	16.2
Danforth	69.5	6.7	3.5	6.9	10.4
Totals	70.0	7.2	3.0	12.6	15.6
<i>Naturally Ventilated Schools</i>					
Montgomery	71.7	6.5	2.0	9.1	11.1
Merrick	68.3	4.1	2.4	6.0	8.4
Townsend	65.8	3.7	1.0	5.4	6.4
Totals	68.5	4.9	1.8	7.0	8.8

* Per cent of Total Pupil Sessions.

The superiority of natural ventilation *appears* clearly established by the average of the gross attendance and health records presented in Table II. All the naturally ventilated schools show lower rates of respiratory illness absenteeism than any of the mechanically ventilated schools, but with groups of various racial compositions, the attendance

figures must be studied in this connection to see if these differences have any bearing on the results.

It is interesting, if not significant, to note that the naturally ventilated Townsend School, attended by pupils of whom 95 per cent are of Italian origin, had the lowest average temperature and at the same time the lowest rates of total absences, respiratory illness absences, and respiratory illness among the pupils present. The naturally ventilated Merrick School, with a population containing but 10 per cent of pupils of foreign parentage, and having the next lowest average temperature of the six schools, ranked second in total absenteeism, in respiratory illness among the pupils present and in total respiratory illness, and third in absenteeism due to respiratory illness. On the other hand, the naturally ventilated Montgomery School, which had the highest average temperature of the six schools, attended by pupils of whom 35 per cent were of foreign parentage, while ranking fourth in total absenteeism, in total respiratory illness and in respiratory illness among the pupils present, held second place in absenteeism due to respiratory illness.

The first step in the analysis of these data is the examination of the race stock of the pupils and of the ratios of respiratory illness absenteeism to total absenteeism and to total respiratory illness.

TABLE III
PERCENTAGE OF PUPILS OF AMERICAN PARENTAGE
PROPORTION OF ABSENTEEISM DUE TO RESPIRATORY ILLNESS
AND
PROPORTION OF CASES OF RESPIRATORY ILLNESS
ATTENDING SCHOOL

School	Percent Pupils of American Parentage	Ratio R. I. Absenteeism to Total Absenteeism	Ratio R. I. Among Pupils Present to Total Resp. Illness
<i>Mechanically Ventilated Schools</i>			
Salem Hyde	91.8	53%	85.5%
Seymour	62.0	33%	84.0%
Danforth	85.5	53%	66.4%
Totals	72.7	41%	80.0%
<i>Naturally Ventilated Schools</i>			
Montgomery	65.0	31%	82.0%
Merrick	91.4	59%	71.5%
Townsend	4.6	28%	84.4%
Totals	54.6	37%	79.6%

Again, as far as averages are concerned, there is relatively little difference between the two groups, but examination of the second column of Table III for the individual schools shows that regardless of the type of ventilation, in those with the higher percentage of pupils of American parents, respiratory illness causes twice the absenteeism it does in the other schools. Likewise, the third column of figures supports the fact

that an American child with respiratory illness is much more likely to be kept at home than is the child of foreign parentage. A study of respiratory illness absenteeism by grades (not reported here) brings out the fact that the higher the grade the lower the incidence of respiratory illness.

Unless these factors of race and age can be compensated, one is not warranted in drawing the conclusion from the rates of respiratory illness absenteeism that one type of ventilation is more favorable than the other.

Such an adjustment may be effected with the elimination of the Salem Hyde and the Townsend Schools. These schools are widely separated and not in the same parts of the city as the other four schools. Further, the Townsend school is attended almost exclusively by pupils of Italian origin. Of the remaining 4 schools, Seymour (mechanical) and Montgomery (natural) are in the same neighborhood, and are attended by approximately the same type of pupil. The same observations hold for Danforth (mechanical) and Merrick (natural).

Restricting consideration to grades 2 to 6 in these 4 schools, we have groups of the following characteristics:

TABLE IV
CHARACTERISTICS OF PUPILS IN TWO MECHANICALLY VENTILATED AND TWO NATURALLY VENTILATED SCHOOLS IN WHICH EFFECTS OF RACE AND AGE ARE APPROXIMATELY BALANCED

	Mechanically Ventilated Schools	Naturally Ventilated Schools
Percentage Pupils of American Parentage	71.0%	76.0%
Average age of pupils (years)	10.0	9.5

In these groups, both the average age and the racial composition of the population are practically identical—very slightly in favor of the mechanically ventilated schools. Despite this fact, the naturally ventilated schools show the better attendance and health records as given in Table V.

TABLE V
CONSOLIDATED ATTENDANCE AND HEALTH RECORDS IN TWO MECHANICALLY VENTILATED AND TWO NATURALLY VENTILATED SCHOOLS IN WHICH THE EFFECTS OF RACE AND AGE ARE APPROXIMATELY BALANCED

	Mechanically Ventilated Schools*	Naturally Ventilated Schools*	Excesses in Mechanically Ventilated Schools
Total Absences	7.0	5.4	29%
Absences due to Respiratory Illness	2.9	2.2	32%
Respiratory Illness Among Pupils Present	8.8	7.8	13%
All Respiratory Illness	11.7	10.0	17%

* Per cent of total Pupil Sessions.

Even with this somewhat refined treatment of these data, the conclusion that natural ventilation of schools is the more healthful is hard-

ly warranted from this study. This warning is of particular importance in this instance in view of the fact that the experience covers but a single year, and, furthermore, the diagnoses of respiratory illness—the fundamental observations on which this preliminary study was based—originated on the one hand in the excuses for absence sent in by the parents of absentees, and, on the other, with the teacher in so far as the pupils in attendance are concerned. *No amount of mathematical refinement can overcome the handicaps of error in original observations.*

The study is being continued during the present school year, with school nurses, who have received special training, responsible for the determination of the existence of respiratory disease (where diagnosis has not been made by a physician), both among the absentees and the pupils in attendance. Although there is nothing to indicate that the methods of the preliminary study tended to favor one type of ventilation over another, restriction of the diagnosis to persons especially trained suggests itself as a more trustworthy foundation on which to base definite conclusions.

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Health Education in India

IN the United Provinces the Red Cross coöperates with the Hygiene Publicity Bureau which carries on extensive health work. Workers are sent out to fairs, religious and social gatherings to give health talks and distribute literature. At a recent exhibition organized by the Public Health Department in Lucknow, the Red Cross and the Hygiene Publicity Bureau had a joint exhibit of models, posters, charts and lantern slides, the latter being arranged in upright frames illuminated from behind by electric bulbs. The other exhibits included smallpox, cholera, plague, malaria and tuberculosis sections, models of sanitary and insanitary villages, houses and wells, a model travelling dispensary such as is in actual use in rural districts and a sanitary engineering stand. Medical men were in charge of the different sections in order to explain the exhibits and give population health talks. In the evenings the film "Why Die of Cholera?" was shown to large audiences.

Special arrangements were made for school children to visit the Exhibition and questions on the subjects treated were afterwards set in school examinations. The Public Health Department also gave a prize for the best descriptive essay on the Exhibition.—*League of Red Cross Societies Bulletin*. Dec. 1, 1927.

The Vitamins as Factors in Health and in Food Values.*

YOUR committee is not unmindful of the fact that it reported under a title of similar purport only a few years ago;¹ but so rapid have been the advances of recent years—not so much in the pure chemistry of the vitamins as in our knowledge of their nutritional relationships, their significance to health, and their distribution among food materials—that a new attempt to summarize the outstanding characteristics of the vitamins as factors in health and in food values seems desirable from the point of view of 1927.

Our report of 5 years ago dealt with vitamins A, B, and C. The present report, or series of reports, must deal not only with the changes which the intervening years have wrought in our ideas regarding these substances, but with some other substances as well. The fat-soluble antirachitic substance is now generally grouped with the vitamins and is commonly designated as vitamin D. Another fat-soluble substance which, in addition to substances previously known, has recently been discovered as essential to reproduction is known as vitamin E. And still more recently there has been a rapid accumulation of evidence, which now in total seems quite conclusive, that what has hitherto been known as vitamin B involves at least two substances, both essential to growth. Since neither of these alone sufficiently fulfils the concept for which the term vitamin B has stood, it would seem unwise to reassign this familiar term to either of the substances which together it has hitherto covered, and much wiser to let "vitamin B" be spoken of as "vitamin B complex" so that the relation between designation and connotation shall not undergo any confusing change; and it is proposed² that the two fractions of the vitamin B complex which are at present clearly recognized be designated respectively as vitamins F and G. (These will be easily remembered because F will stand for the antineuritic substance so closely associated with the name of Funk; and G for the factor which Goldberger believes to be preventive of pellagra.)

Few new ideas in science have gained currency with the public so rapidly as has the idea of vitamins. Nor has it escaped commercial exploitation. Numerous preparations are being marketed through the

* Report of the Committee on Nutritional Problems presented to the Food and Drugs Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 19, 1927.

drug trade at high prices under claim of containing one or more of the vitamins in relatively concentrated form. This is not the place to attempt the discussion of the merits of such preparations. In due time their standardization will doubtless receive the attention of the federal authorities charged with the administration of the Food and Drugs Act.

To us as a Committee on Nutritional Problems, it appears that, while the physician may occasionally desire to employ a vitamin concentrate, the public will find it much safer and more economical to obtain vitamins as normal constituents of a wisely chosen food supply than from the drug store, whether in the form of pills, powders or extracts, or at the soda fountain. Even should all such preparations be held to the complete fulfillment of their claims for vitamin values, it is plain that in order to yield the manufacturers a profit all such highly manipulated products must be sold at prices which make their vitamins cost more than when these vitamins are purchased in the form of foods. When the importance of the vitamins is fully recognized and given due weight in the planning of food supplies, there will probably be but rare occasion for the purchase of vitamins in any other form than that of staple foods.

We wish to emphasize, however, the need for full recognition of the importance of conserving the natural vitamin values of foods to the fullest possible extent; and of frankly acknowledging that every diminution of vitamin content is a diminution of food value. Up to the present we have, perhaps, been too complacent on this point, tending sometimes to evade serious consideration of it on the ground that "we will probably get enough of the vitamin in our liberal mixed diet anyway." But we do not ignore the abstraction of a part of the cream from market milk on the ground that the partially skimmed milk is still an excellent food and that our mixed diet would probably furnish us enough fat anyway; we recognize that to whatever extent the milk-fat with its vitamin A is diminished, to that extent the food value is lowered. So we should recognize with equal clarity and frankness that when much of the vitamin B of wheat or rice is removed in milling, or much of the vitamin C of cabbage or spinach is lost in cooking or canning, to that extent there is a diminution of food value, however excellent the resulting product may be, and however likely that at least our minimum requirements for vitamins will be met.

Especially should this be emphasized in view of the fact that recent investigations tend strongly to the view that "enough" is an ambiguous term as applied to our vitamin intake, because the optimum (the amount that we can use with greatest advantage to our health) is apparently manyfold greater than the amount which we must have

to protect us from deficiency disease. Of total food (calories) we can advantageously use only a little more than we actually need, for the surplus, stored as fat, would soon render us too stout; of protein no large surplus can be stored and an intake more than double the actual requirement is rightly regarded as a possible source of danger; but in recent experiments with vitamins, intakes of several-fold the amounts demonstrably needed have shown no danger but on the contrary have proved distinctly advantageous. Hence, while for some factors of food value and nutritive requirement the optimal intake is only a little above the actual need, with the vitamins the case appears to be different and more like that of fresh air—we can exist without conspicuous injury on relatively little, but we can use advantageously a manyfold larger allowance, generally as much as we can conveniently get.

VITAMIN A

It seems unnecessary to recall here the story of the simultaneous discovery and early investigation of vitamin A by McCollum and Davis¹ and by Osborne and Mendel² or to rehearse the abundant evidence that a shortage of vitamin A in the food, results, sooner or later, in a widespread weakening of the tissues and functions of the body. Wolbach and Howe,³ among others, emphasize the fact that in addition to the well known eye trouble, shortage of vitamin A causes many other pathological changes. These include the presence of abscess-like cavities filled with yellow cheesy-like material at the base of the tongue, in the pharynx, and in the submaxillary glands. They find that the cavities are cysts lined with a stratified keratinizing epithelium and the cheesy mass of mixture of desquamated keratinized cells and leucocytes. Microscopic study of the lesions in rats killed at progressive stages of vitamin A deficiency has shown that the principal change is "transformation of various epithelia into a stratified squamous keratinizing epithelium. This change is practically constant in the upper respiratory tract, including the whole of the nasal passages, larynx, trachea, and bronchi." Similar pathological changes are found widely distributed elsewhere in the body also. Because so many of our staple foods are so poor in vitamin A and because a shortage of this substance weakens the body in so many ways and increases its susceptibility to so many infections, it appears probable that differences of intake of this vitamin, more than of any other, affect the general health and length of life of the people of today—and this through such differences in food habits as are so familiar as to be regarded with indifference.

The experimental evidence suggests that vitamin A probably plays

in the body the double rôle of a tissue constituent and also of a "regulatory" substance concerned with the maintenance of normal conditions and the control of nutritional processes.

Several investigators have emphasized the fact that respiratory disease is more frequent among experimental animals whose food is relatively poor in vitamin A, and it has also been found by careful experimental investigation that in such cases there is also an actual diminution of the vitamin A content of the lung tissue. Conversely, a liberal intake of vitamin A leads to increased resistance, a higher vitamin A content of lung tissue, and an increased storage of this vitamin in the liver. Muscle tissue contains but little vitamin A in any case.

Recent investigation has strongly emphasized both the extent to which the body can store vitamin A, chiefly in the liver, and the great importance of such a reserve store of this vitamin to the life and health of the individual. In a carefully conducted series of experiments upon laboratory animals, vitamin A was fed up to about 80 times as much as is usually considered necessary for adequate nutrition and even this high level of intake was found advantageous through increasing the amount stored. In these experiments with rats, the body usually had acquired its maximum reserve store of vitamin A at about the time that the growth was completed; but by liberal feeding with food rich in this vitamin it was possible to build up in a younger animal a larger store than the maximum ever acquired by the animal of less fortunate nutritional history.

Since the storage of vitamin A in the body has thus been shown to be so important, it becomes plainly a wise economy to invest rather freely in this factor of food value in order that the body may be adequately insured in this respect.

In the light of this newer knowledge regarding the extent and significance of the storage of vitamin A in the body, it becomes probable that the supposed lesser need for this vitamin by the adult than by the young is apparent rather than real, and is largely attributable to the facts: (1) that the development of the adult has carried him beyond the point at which a deficiency becomes quickly manifest in any such apparent sign as the cessation of growth; and (2) that the adult has presumably had more opportunity to provide himself with a bodily store of this vitamin which then carries him over periods of deficient intake.

That vitamin A plays an extremely important part in the nutrition not only of the young but also of the adult is now well established.

Sherman and MacLeod⁷ have described experiments in which

parallel groups of rats of identical previous history were fed upon two types of diet, one rather low and the other fairly high in vitamin A, from soon after weaning-time until natural death. The smaller amount of vitamin A proved sufficient for normal growth up to nearly normal adult size, but not for successful reproduction, and rarely did it support satisfactory longevity. The parallel animals receiving the more liberal allowance of vitamin A grew to fully average adult size; were successful in reproduction and the rearing of young; and lived on the average a little over twice as long as those on the diet equally good in all other respects, but lower in vitamin A.

These experiments show strikingly that a proportion of vitamin A in the food, sufficient to support normal growth and maintain every appearance of good health for a long time at least, may still be insufficient to meet the added nutritive demands of successful reproduction and lactation.

Along with the failure to reproduce successfully there usually also appeared in early adult life an increased susceptibility to infection, and particularly a tendency to break down with lung disease at an age corresponding to that at which pulmonary tuberculosis so often develops in young men and women.

The bacillus involved is different; but the close parallelism of increased susceptibility of the lung to infection at this stage of the life history appears very significant, especially in view of the fact* that the vitamin A content of lung tissue varies with that of the food.

Especially noteworthy was the repeated observation of young females growing normally and presenting every appearance of good health throughout youth on a diet low in vitamin A but failing utterly to succeed in the rearing of a second generation, and showing a strong tendency to break down in health at an age at which they should have been in the prime of life.

Thus it is clearly shown that vitamin A is an even more important factor in health and in food values than has previously been appreciated, for it must be supplied in liberal amounts not only during growth but in the food of the adult as well, if a good condition of nutrition and a high degree of individual and community health and vigor are to be maintained.

In view of the manifest importance of such quantitative differences in vitamin A intake as may readily occur among people living upon diets regarded as normal, methods for the measurement of the relative amounts of this vitamin in different foods have been developed and the more quantitative our information becomes, the more we are

impressed with the extremely wide differences among foods with respect to their vitamin A values.

Vitamin A is formed in the green leaves of plants and in general these are much richer in this vitamin than are other organs of the plant. The pale inner leaves of headed lettuce and cabbage are not nearly so rich as are the green outer leaves; and recent careful work has shown that the green plant tissues other than leaves which we use as food in the form of string beans and green peppers, are, like the green leaves, rich in vitamin A.

Animals obtain their supplies of this vitamin from plants, either directly or through other animals. Vitamin A can be stored in the animal body as already noted. This storage occurs mainly in the liver; but significant amounts may also be stored in adipose tissue, depending upon the food of the animal and the rapidity of fattening. Muscle tissue contains very little vitamin A, even when the food has furnished it in abundance. The amount in the glandular organs is variable depending upon how the animal has been fed. Eggs and milk are more important and constant sources of vitamin A than are any of the body tissues.

It is chiefly because of their outstanding importance as sources of vitamin A, as well as of calcium, that McCollum has designated milk and the green vegetables as the "protective foods." In view of the foregoing it seems advisable to repeat the recommendation made by the committee in its report of last year, namely, to emphasize the importance of including milk in the daily diet to the extent of at least a quart for every child and not less than a pint for the adult.

Space does not permit any detailed discussion here of the stability of vitamin A; but, in brief, it may be said that this vitamin is sufficiently stable under all the conditions commonly encountered in the industrial and household manipulations of the foods which chiefly furnish it, so that foods of the kinds indicated as good sources may usually be counted upon to retain their value in this respect as they appear upon the dining table. The recent work of Miller² shows that heating at reduced acidity or slight alkalinity (about pH 9) which is very destructive to vitamins B and C, has little effect upon vitamin A.

In view of the limited time allowed for each communication at these meetings, and the fact that committee reports should be published in the same form in which they are presented and accepted, it is impracticable to discuss the other vitamins in the present paper. If the section desires, we shall be glad to report in similar manner upon other vitamins at a subsequent meeting or meetings.

H. C. SHERMAN, *Chairman*
C.-E. A. WINSLOW
E. L. FISK

I. GREENWALD
T. P. B. JONES
D. B. JONES

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The Parker Bill Is Passed

THE Parker Bill for the coördination of the public health activities of the federal government was passed by the House of Representatives on March 7, 1928. This measure, H. R. 11026, is in somewhat revised form, as the original first section, which would have given the President power to transfer to the U. S. Public Health Service bureaus carrying on health work, was deleted, and the second section was changed, so that scientific personnel of the U. S. Public Health Service would be detailed to other bureaus not by order of the President, but only at the request of an executive department.

The remainder of the bill is the same, and contains important provisions for increasing the scope of the Hygienic Laboratory, giving a commissioned status to sanitary engineers and other non-medical scientists, the creation of a nurse corps, establishment of a national advisory health council, and the detail of scientific personnel to educational and research institutions.

Before this bill can become a law it must be adopted by the Senate and signed by the President. A companion measure, S. 3356, has been introduced in the Senate by the Honorable Wesley L. Jones of Washington and has been referred to the Committee on Commerce of which Mr. Jones is chairman. In spite of the emasculation of the first two sections, the bill still is of vast importance to national health, and sanitarians should now communicate with their senators and urge their support for the Jones bill for federal health coördination.

Time and Cost Study Problems*

AN analysis of the problems of the time and cost in nursing involves the following points:

Does the present method of computing costs, with the visit as the unit, satisfy our needs?

If not, would it be of benefit to establish a cost based on time, but translated into time by each type of visit?

Is it practicable to work toward a specification form for content of visit?

How will the charge item be adjusted?

Is it not worth while for each visiting nurse service to study the situation further?

Referring to the first item it was pointed out that the causes for variations in costs per visit have been ignored. Too, in trying to reach comparable figures there has been an effort to reach the same number of visits for each organization. This leads to a speeding-up process which is a decidedly poor method of obtaining good work from a staff.

The nursing day is divided into travel, record keeping, field work, conferences and hours devoted to staff education.

We are already putting into practice many suggested schemes for decreasing travel and record time, and thus releasing time for field activities.

The fact that the visiting nurse is the logical agent to disseminate health education for disease prevention was emphasized in the report. In order to discharge her duties in a most satisfactory way it is necessary for her to acquaint herself with most recent facts, for instance in the fields of nutrition and mental hygiene, and to confer with experts about her special case problems.

Time is needed. If time is allowed, then visits go down and costs go up, and by following our present methods of computation, the very things we want for the promotion of community health are forbidden us because they make our cost prohibitive.

After further analysis of this point it was suggested that nursing organizations adopt "the average time per type of visit as the cost unit," and "instead of stating our charge on the basis of time, the visiting nurse service can quote its rates to the patient on the basis of type of work done."

If our nursing is figured on basis of time spent, the acute nursing costs will be properly allocated and the increased charge for these services will permit us the opportunity we want for the educational and preventive program.

* Abstract of a paper, Time and Cost Study Problems, by Marguerite A. Wales, R.N., General Director, and Mabel C. DeBonneval, Statistician, Henry Street Visiting Nurse Service, New York, N. Y., read before the Public Health Nursing Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 19, 1927.

The complete paper will appear in the March, 1928, issue of the *Public Health Nurse*.

Another reason given for the adoption of the time unit figure of cost was that it would direct attention to the quality of work and to the content of the visit.

Since the American Public Health Association is working toward specification of content of service, might it not be well to institute an appraisal form of our nursing visit content. There would be one form for the ante-partum visit, one for the post-partum, etc., and by an inspection of the form as related to each organization's work we could readily account for the time spent in the visit. It will indeed be necessary to adopt some such method, because if we use only the time unit and we come to a comparison of similar services in communities, we have no way of arriving at any standard of time.

An analysis must be made of the division of time given over to the various services and the nursing organizations must be cognizant of the health needs of the community.

An ever present source of concern is that the fear that the cost of visiting nursing will become a prohibitive item. Any growth in the welfare program means a corresponding increase in the average per visit cost, so that the net result is a lessening of the fee charged for contract acute work. Until the associations have studied their visits we cannot say what the result of this change of basis of charge would be.

Disposal of Sewage and Industrial Wastes

Definitions of Terms*

Mr. John F. Skinner, Chairman,
Committee on Disposal of Sewage and Industrial Wastes,
Public Health Engineering Section, A. P. H. A.

Dear Sir:

I hereby present the following report on Definitions of Terms Used in Sewerage and Sewage Disposal Practice.

In 1915 the Committee on Sewerage and Sewage Disposal of the American Public Health Association, George S. Webster, Chairman, undertook the preparation of "Definitions of Terms Used in Sewerage and Sewage Disposal Practice," and at the Annual Meeting held in October, 1917, after considerable study, involving the replies to questionnaires and a large amount of correspondence and discussion, the committee presented its report. This was printed in the October, 1917, JOURNAL but was never brought up for official approval. Meanwhile sewage disposal especially was being developed along new lines and by 1923 it was felt desirable that the entire subject should be reviewed and the definitions brought up to date and formally adopted by the Association. A new committee was thereupon appointed with Mr. John F. Skinner, Chairman.

* The Definitions of Terms Used in Sewage Disposal Practice, which is the Report of the Joint Committee of the A. P. H. A. and the A. S. C. E., will be published as a manual by the A. S. C. E. Members of the Public Health Engineering Section of the A. P. H. A. will receive copies. See *A. J. P. H.*, Feb., 1927, p. 199 for report of committee.

Meanwhile the subject had received attention from the Sanitary Engineering Division of the American Society of Civil Engineers, who appointed a similar committee with the late Prof. George C. Whipple as Chairman. At the Annual Meeting in 1924, on the receipt of the report of Mr. Skinner's committee a Resolution was passed by the Sanitary Engineering Section of the Association providing for coöperation between the two committees in the preparation of a joint report. This Joint Committee submitted a Questionnaire which brought out a large number of suggestions. These were to a considerable extent canvassed and tabulated when it was decided to turn over all the material and results reached at that time to the undersigned to prepare a final draft. This draft would then be submitted to each of the two organizations interested for approval.

As there were a number of definitions concerning which there remained a decided difference of opinion, these were submitted to ten engineers of prominence in sanitary engineering, who had not it is believed, with one exception, served on past committees devoted to the subject. The answers received, together with a number of valuable suggestions offered voluntarily by others, served to clarify the debatable points to such an extent that the entire list could be put in shape for presentation.

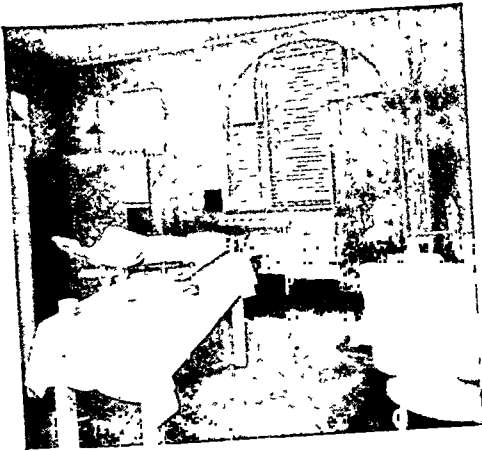
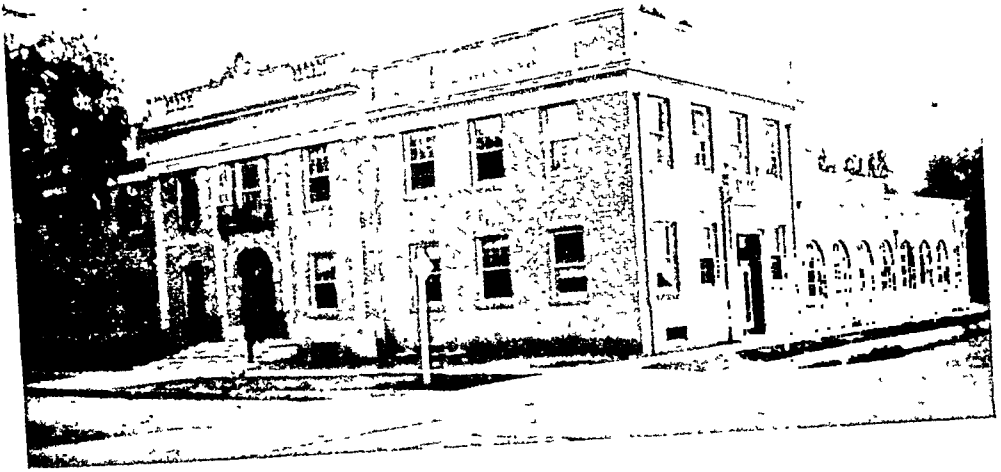
Owing to the extended and conscientious study given to this matter and the care taken to meet the views of those whose judgment was believed to carry particular weight in these special lines of technology, it is hoped that the final list as now submitted may meet the approval both of the American Public Health Association and the American Society of Civil Engineers.

In both the theory and technic of sewerage and sewage treatment we are making a steady advance. Especially is the matter of treatment undergoing a process of evolution. Under these conditions some terms now in use may become obsolete or modified in meaning while new terms will come into common use. For this reason no set of definitions can be said to be adequate and proper for all time but should be subject to a periodical revision, say once a decade, and it is with this reservation that the definitions are herewith submitted for approval.

KENNETH ALLEN

First Maternity and Infant Health Center in Milan

IN compliance with the provisions of the Italian maternity and infancy welfare law of 1925 the first maternity and infant health center was recently established in Milan. The purpose of this health center is the promotion of maternal and infant health rather than the treatment of physical defects. Several organizations, among them the Maternity Insurance Fund of Italy, and the Italian Infant Welfare Union, one an official, the other a private organization, coöperate in the management of the center. The center is equipped according to modern hygiene standards and the work is done by a trained staff. A woman graduate in puericulture will soon be appointed as home visitor to replace the volunteers now connected with the center.—*La Pediatria*, Naples, Nov. 1, 1927, p. xix.



POMONA'S HEALTH CENTER

The Pomona Health Center, recently opened to serve the citizens of Pomona, California, was erected by Los Angeles County at a cost of \$68,000. The site was given by the City of Pomona and the institution is located adjacent to the other municipal buildings in the civic center. It is considered one of the most adequately appointed and modern health centers in the country. The center is equipped and staffed to give service and treatment to those seeking it.

EDITORIAL SECTION

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OF WHAT USE ARE OUR HEALTH OFFICIALS?

IT is worth while to consider the answer to this question. It will give faith, courage and hope to our health officers. It will remind a generation passing off the stage of terrors well-nigh forgotten, and it may lead many others, complacent in our 20th century environment, to a fuller appreciation of the riches of health that have been won with so much toil.

Fear is the genesis of the health officer. American public health is built on a foundation of epidemics. In the mid-19th century no city was free from the fear of yellow fever, smallpox, cholera and the dreaded ship fever brought in by our hordes of immigrants. Typhoid fever, just differentiated from typhus, was reaping a harvest in our growing cities. Scarlet fever, then a virulent disease, appearing in waves, was the great terror of mothers until a worse came in the form of diphtheria in the late 50's. In the early years, special boards, or committees, were organized by communities to cope with the outbreak after it was upon them, and they did splendid work, though often ineffective because too late. Far-seeing citizens began to realize that, as in fighting fire, so in fighting disease, it is necessary to be ready at the first alarm. The emergency boards of health became permanent and there has thus gradually grown up our organized public health service, national, state and local.

The terror inspired by the great epidemics of the 19th century has vanished. Even the health workers have forgotten that cholera once caused a death rate of 140 per 100,000 population in New Orleans and stopped all business in New York; that yellow fever brought commerce to a standstill and depopulated large cities; that typhoid fever caused a mortality in one year in Chicago of 175 per 100,000 population; and that diphtheria death rates of over 300 were not unknown. In the 70's of the 19th century, as on many previous occasions, smallpox ravaged our cities and towns, paralyzing business, and wasting millions of

dollars. That things are better now is due almost entirely to official health work. There were then no foundations to combat cholera, no typhoid fever associations, no anti-smallpox societies; though there was an organization of anti-vaccinationists to hamper the health officers in their work.

Just as rapidly as science has shown the way, official health workers have followed. It is true that scarlet fever and diphtheria still prevail, but do not kill as formerly. If Chapin's theory is correct, the isolation of the severe strains of scarlet fever has been an important factor in making the deaths negligible. So, too, the phenomenal decrease in diphtheria mortality is due, in large measure, to the efforts of health officials in encouraging the use of antitoxin and in securing the immunization of children. Of all the great epidemics, influenza is the only one against which science has failed to furnish health officers with effective weapons.

In the warfare against infectious diseases, official health agencies employ means which cannot be used so effectively by other agencies, if used at all. Thus the control of the environment is naturally a municipal or state function. State and local health officers have shown the need for the protection of water supplies and have indicated how this may be secured. They have shown the necessity for proper excreta disposal, not only for cities and villages, but for every farm in the land. Health officers have never feared to urge public improvements necessary for the public health, even when opposed by politicians, the press and powerful commercial interests. It is almost entirely due to such efforts that typhoid fever is a vanishing disease. It is because municipal health officers have banished *Aedes aegypti* from our cities that yellow fever is extinct. Malaria and hookworm disease can be controlled by controlling the environment, and progress is dependent upon local official county health organization.

Though the isolation of contagious diseases is not the panacea it was at one time thought to be, it is still indispensable and must necessarily be enforced by state or local officials. Of greater importance is immunization. Long experience has shown that, if left to their own devices, comparatively few will avail themselves of the benefits of this method of protection against smallpox, typhoid fever, diphtheria, rabies, or other diseases. Only the health officer has the interest to push this practice to an extent to secure worth while results and, even in the presence of virulent smallpox, he finds it difficult enough. Until recently other agencies have done little.

Though the importance of pure food to good health has been much exaggerated, it is necessary that a fairly strict supervision be kept. This is especially true of milk. The public and the medical profession

would be greatly disturbed, and not a little harm would result, if we should revert to the *laissez faire* practice of half a century ago.

Another great thing which the health officer has accomplished for the public and for the medical profession is the establishment and popularizing of the diagnostic laboratory. The first of these laboratories was set up in the health department of New York City and fortunate it is that other city and state departments so rapidly followed suit.

An allied health department activity is the distribution and in some instances the production of biological products. Again New York City showed the way by distributing and by making known the value of diphtheria antitoxin. When one sees the number of physicians who now fail to use this remedy, one wonders what the loss of child life would have been if health officials during all these years had not constantly preached to the public, and to the doctors, the value of this remedy. They find it necessary to continue the preaching even now.

With the control of the old time epidemics, health officers did not rest on their oars. The advancement of medical science has been continually developing new methods for fighting disease and promoting health. Many new and unofficial agencies have come to the aid of official health officers and have done much to stimulate the less energetic and the poorly equipped among them. Not only have the old time epidemics disappeared, but the general death rate has been cut in two and phenomenal progress has been made in prolonging life and in reducing a number of specific death rates. Better economic conditions, better medical treatment, the entrance of many new agencies into health work, as well as other factors, have had a share in securing these results. Health officials, especially local health officers, have had an indispensable share in the great work.

The new health movement of the present century relies largely on education. For many of the agencies which are employing it so strenuously this is somewhat of a venture. So long, however, as there have been health officials, it has been one of their most important duties to educate their communities. Of late years they have been taking a leading part in this movement. Efficient health officers, if the politicians let them stay in office long enough to get acquainted with their constituents, wield an enormous influence and, through their bulletins, posters, lectures, newspaper articles and other means, perhaps accomplish more even than does more elaborate material from a distant source. Bundesen, just before his removal, got out some exceptionally fine literature, but the budget of most health officers does not permit them thus to vie with the great foundations.

Every health officer, whether medical or otherwise, realizes that the

scientific practice of medicine is the foundation of public health. State health officers have for years striven valiantly to improve medical licensure, to drive out the quacks and to fight nostrums. A great number of health officials, particularly local health officers, have done an immense amount of good by their bulletins, lectures, radio talks and newspaper articles in acquainting people with the achievements of medicine and in leading them to a firmer trust in scientifically educated physicians. The full-time health officer has a tremendous advantage in this, for the people believe that he has no ulterior motive. Perhaps the surest way to combat quackery is not by use of police power, but by the more positive and permanent method of leading the public to realize the worth of the well educated physician.

The 20th century public health movement is characterized by the development of unofficial agencies to combat specific diseases, or to promote personal health. To a far less extent than in the fight against epidemics, does this movement involve the exercise of police power and so is less dependent upon official action. Nevertheless, the antituberculosis campaign would be greatly handicapped if no control could be exercised over recalcitrant cases, if notification were not compulsory and if mortality and other data were not collected by official statisticians. It would be impossible to carry on the present fight against venereal diseases without the aid of the health officers. Though private agencies are doing much for the prevention of blindness, state and municipal health officers must be the ones to distribute prophylactics and to secure proper care of infected babies.

Though voluntary agencies have done splendid work in protecting the health of the infant and of the school child, the great burden of directing consultations, prenatal clinics, control of midwives, supervision of boarding farms and day nurseries and the medical supervision of school children falls upon health officers, sometimes in the health department and sometimes in the school department.

To an even greater extent, the campaigns against malaria and against hookworm infestation are made to center around the local health organization.

Then, too, the part played by official health workers in the development of voluntary organizations must not be forgotten. They have always been active promoters of the national, state and local associations.

The number of agencies actively engaged in promoting the public health is large. Perhaps their work sometimes overlaps, but there is room for all. Coördination and coöperation are necessary, and in the state, the city, the town and the country, the health officer, the legally constituted representative of the people, is the logical agent for bringing about this coördination, for it is he who works continuously, and

for the most part successfully, for this. It is impossible to conceive of health work as going on effectively in our thousands of communities except as centering around the health officer. Indeed it is a matter of common knowledge that health has improved to a greater extent in our cities with their well organized health departments than it has in rural districts, such a large proportion of which are still without an adequate public health service.

The Rockefeller Foundation is devoting its chief effort in the cause of public health to the development of local health organization and to improving its personnel. The U. S. Public Health Service, the State health departments and the insurance companies all believe that the local health executive must be the center of community health work. What is needed is not an increase in his powers, but protection against wicked political interference.

COMMON CAUSES OF ALLERGIC DISEASE

WHILE seldom dangerous to life, there are few things which cause greater discomfort than hypersensitiveness, the importance, as well as frequency of which has been so abundantly demonstrated during the last few years. Many cases of asthma, for example, which had made the sufferer practically hopeless of future usefulness, have been cured by very simple means. In spite of all that has been written, it is probable that the great majority of physicians are still not aware of the various substances met with in daily life which produce allergic disease.

Success in the treatment of these troubles depends upon the acuteness of the attending physician in connecting cause and effect. Biological houses carry long lists of substances with which one comes into daily contact, by the use of which the cause of the trouble is often easily diagnosticated through the skin test, and the cure is often easy. On the other hand, some very puzzling cases are met with. We recall one in which contact with silk in practically every stage of manufacture produced most alarming symptoms. In other cases the patient is found sensitive to a number of substances and then the doctor must rely upon his common sense and observation to connect exposure and the result of the skin test. A recent writer¹ has stated that this is generally due to our ignorance of, or disregard for, the relation between raw materials and the finished commodities with which one may come into frequent contact.

It is impossible to give here the complete list of substances in common use which may be the cause of allergic disturbance, but among them we must call attention to pillows, usually made of the feathers of some bird, or of different fleeces and animal hairs; mattresses, which

are usually made of some fiber or hair; blankets and rugs which are made of cotton, wool or some animal product; furniture which is upholstered with various fibers as well as animal fleeces; clothing made chiefly from cotton and animal fleeces; and furs, which are practically always animal fleeces, but very often mislabeled, and given some fancy name, which makes recognition difficult. The majority of furs are not purchased under their proper names. Most of them are clipped, sheared, dyed and otherwise manipulated to make them resemble more expensive products. There are a number of materials which contain no silk at all, but are sold under names suggesting that they contain or are made of silk.

In other cases where clean cotton, for example, is supposed to be the material used, practically all of the hull and dried seed will be found. Many materials made of cotton are sold under names suggesting that they are made in part or in whole of linen.

So the story goes, and the physician may be obliged to go through a large number of substances which are not even suggested by the names of those which he has reason to believe that the patient has come into contact with.

The partial or complete mislabeling of fibers used in the manufacture of domestic goods is extremely common. It is a matter over which the medical fraternity has no control, though it suffers from difficulties of diagnosis and treatment in consequence.

One might expect, in this day of the almost universal employment of cosmetics, that we would be able to add a number of these to the list, but orris root, which is very widely used, seems to be the only one which is frequently found at fault. It produces asthma, skin disturbances and hyperesthetic rhinitis. Almost all face and tooth powders contain orris root, and it is widely used in making perfumes. New names are being constantly invented, which further tax the ingenuity of the physician in making his diagnoses.

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ASSOCIATION NEWS

COMMUNITY HEALTH AND HOSPITAL SURVEYS

THE attention of the members of the Association is invited to the following statement from a sub-committee of the Committee on Administrative Practice. The program as outlined has been developed by the Sub-Committee on Organized Care of the Sick, reviewed by the Executive Committee of the Committee on Administrative Practice and submitted to 564 state, county and local health officers to whom the *Health Officers' News Letter* is addressed, and is now submitted to the members of the Association at large for their information and for criticism and suggestions upon this tentative statement of policy of community surveys.

What restrictions or extensions upon the type of survey described in this statement do you believe should be laid down by a committee of your Association? Has your community a problem involving the facilities for organized care of the sick which such studies might help to solve?

C.-E. A. WENLOW, Dr.P.H., *Chairman,*
Committee on Administrative Practice

DURING the past year the Committee on Administrative Practice has been called upon to broaden the scope of its surveys and appraisals, having been requested in two cities, in which appraisals were asked for by the health officer, to include also studies of the hospitals and other organized facilities for the care of the sick. At the present time requests of similar scope are pending both from cities and several rural areas. It was decided last year by the committee to meet the requests, and on the basis of the experience gained, to determine thereafter the scope and policy appropriate to surveys conducted under the commit-

tee's auspices in the future. It is apparent that a real demand exists for a broader type of survey than had been conducted by the committee previous to 1927, and that facilities for the organized care of the sick are so closely related to the public health interests that the two should often be studied and considered together. On the other hand, it is obviously desirable for the American Public Health Association not to go beyond the field appropriate to a national association, whose primary interests lie in prevention rather than in curative work, or in individual medical practice.

For the purpose both of defining the problems that should be dealt with, and of guiding the scope and method of future surveys, a sub-Committee on the Organized Care of the Sick has been formed with the undersigned membership, representing various interests, in order to touch all the essential phases of the problem. Three members of the committee have been suggested informally by the president of the American Hospital Association.

The sub-committee, in several meetings and by correspondence has given careful consideration to the extent and limits which are appropriate to surveys under auspices of the Committee on Administrative Practice. The committee is prepared to consider requests and suggestions for surveys including hospitals, out-patient departments and other clinics, city physicians and other organized resources for the care of the sick.

The committee will not be concerned with studies of internal administration of hospitals or in the personal diagnostic or therapeutic care of patients by their physicians in hospitals or clinics, the planning and construction of their physical plants or the technical and educa-

tional standards involved in any of these institutions. It is intended that the Association carefully avoid entering fields in which such organizations as the American Medical Association, the American College of Surgeons and the American Hospital Association have primary interests and important existing activities.

Surveys within the proper scope of the committee will be regarded for the present as including such matters as the need for hospital beds, clinics or other organized curative facilities of a community; the social and economic groups for whom such facilities are needed; the geographical distribution and the interrelations of these facilities to one another and to other interests and agencies of the locality. Surveys of this type would ordinarily be conducted in connection with a study and appraisal of the official health department, the health work of the board of education and voluntary agencies (Visiting Nurse Association, tuberculosis association, etc.) requested by the health officer.

The sub-committee has been charged with the responsibility of supervising the

policies and methods of future studies involving the organized care of the sick. All future requests for surveys in which this is a factor will be carefully studied with the aim of defining the appropriate scope of the study and the elements of the local problem, to render each study as effective and as inexpensive as possible. The sub-committee has also in hand the preparation of suitable survey schedules.

The expense of surveys includes the actual cost of the field work, plus an allowance for expenses of the central office incurred in connection with the survey, including time of professional and clerical staff.

The committee regards this policy as tentative. It is entered into in response to apparent demand from the field itself.

Sub-Committee on Organized Care of the Sick

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W. F. WALKER, D.P.H., *Secretary*

ENUMERATION OF PUBLIC HEALTH WORKERS

THE Executive Board of the Association has authorized an enumeration of public health workers. Plans are now in process of preparation by a Committee on Census composed of John L. Rice, M.D., Health Commissioner, New Haven, Conn., Chairman; Prof. John F. Norton; Arthur E. Gorman; George Van Buren; Prof. C. E. Turner. The first task of this committee is to establish definitions and classifications. The committee met on February 10 and will meet again March 15.

CENTRAL PROGRAM COMMITTEE

AT the first meeting of the Central Program Committee, held on February 11, it was decided to begin the An-

nual Meeting program with the opening General Session on Monday evening, October 15, reserving the first day for committee meetings and meetings of related organizations. The program of the sessions will begin on Tuesday morning and continue through until Friday afternoon. The General Sessions will also be held on Wednesday and Thursday evenings, one of these sessions probably being a banquet.

The section programs are rapidly taking shape and plans are under way for joint sessions between the Health Officers and Public Health Nursing and Child Hygiene Sections; the Laboratory Section with the Food, Drugs and Nutrition Section and with the Public Health Engineering Section. The Laboratory Section will also have a joint session

with the Child Hygiene and Industrial Hygiene Sections on the subject of ventilation. Some of the sessions of the Child Hygiene Section will be held jointly with the American Child Health Association, which will hold its Annual Meeting at the same time.

All sessions will be held at the Hotel Stevens. The usual technical exhibit will be held in the exhibition hall at this hotel and space is being rapidly reserved by the leading manufacturers of scientific equipment and health products.

AWARD FOR PUBLIC HEALTH WORK

RHODE Island has won the prize for the year 1927 offered by the General Federation of Women's Clubs for having the highest percentage of local clubs engaged in public health activities. The award is one month's service of one per-

son engaged in making a survey of a particular community. Warwick, R. I., was selected by Dr. B. U. Richards, State Commissioner of Health, as the community to receive this service. The field work will be rendered by James Wallace, M.D., Associate Field Director, Committee on Administrative Practice, American Public Health Association, and Lucy Oppen, Staff Associate, Division of Health Education, American Child Health Association. The report of this survey will be published by the Metropolitan Life Insurance Company.

POCKET MEMBERSHIP CARDS

ATTRACTIVE yellow pocket cards have been prepared to be sent to all members and Fellows of the Association, who are in good standing with their Association. They will be mailed April 1.

NEW MEMBERS

Jane C. Allen, B.S., R.N., New York, N. Y., General Director, National Organization for Public Health Nursing

M. Elizabeth Barker, S.B., M.S., Springfield, O., Director, Health Education, Wittenberg College

John Barnes, Dorchester, Mass., Mechano Therapy (Assoc.)

Charles W. Bartlett, M.D., Tampa, Fla., City Health Officer

Howard H. Bell, M.D., St. Louis, Mo., Tuberculosis Controller

Mrs. Don C. Bliss, Jr., Singapore, S. S. (Assoc.)

Alice F. Blood, B.S., Ph.D., Boston, Mass., Director of the School of Home Economics, Simmons College

Walter B. Bruce, M.D., Helena, Ark., County Health Officer

J. P. Bushong, M.D., Los Angeles, Calif., Supervising Certified Milk Production, Los Angeles County Medical Association

Nellie E. Bussell, B.A., M.A., Chicago, Ill., Head, Physical Education Department, Chicago Normal College

Ada Chew, Chelsea, Mass., Staff Nurse, U. S. Naval Hospital (Assoc.)

Roy F. Courtney, M.D., Leadville, Colo. (Assoc.)

John D. Craig, Dover, O., Health Commissioner and Sanitary Police

Mary E. Davidson, Hillburn, N. Y. (Assoc.)

A. D. DeHaven, M.D., Xenia, O., Health Commissioner

Robert C. Dryden, Pima, Ariz., City Health Officer

G. F. Earnshaw, Newton, Mass., President, Earnshaw Sales Co. (Assoc.)

Robert H. Elrod, M.D., Toledo, O., Health Commissioner

Helen L. Felkner, Ostrander, O., Instruction Nurse, Division of Public Health Nursing, State Department of Health

Marion Ferguson, R.N., Kansas City, Mo., Field Nurse, Missouri Tuberculosis Association

Ernest B. Ford, Little Rock, Ark., Sanitary Inspector

Sylvia M. Gagner, R.N., Nashua, N. H., Director and Supervisor of Good Cheer Society's Visiting Nurse Service

Fuejo Garcia, M.D., Vigo, Spain, Quarantine Officer

Mary L. Hahn, M.S., Springfield, Ill., Specialist in Health Education for State Teacher Training Colleges

- Walter H. Hassed, M.D., Cheyenne, Wyo., State Health Officer
- J. J. Heaton, M.D., Tiffin, O., District Health Commissioner
- Rhoda G. Hendrick, M.D., Lansing, Mich., Lecturer on Prenatal Care, Bureau Child Hygiene, State Department of Health
- Percy R. Howe, D.D.S., Boston, Mass., Chief of Research Laboratory, Forsyth Dental Infirmary
- Irma Law, B.S., R.N., St. Louis, Mo., Inspector and Field Representative, State Board of Nurse Examiners
- Bertram B. Jaffa, M.D., Denver, Colo., Manager of Health and Charity, City and County of Denver
- Park B. Jenkins, M.D., Waubay, S.D., Superintendent of State Board of Health
- Vern R. Jones, Wyandotte, Mich., Manager of Cleaner and Cleanser Department, J. B. Ford Company (Assoc.)
- Arnold H. Kegel, M.D., Chicago, Ill., Health Commissioner
- James P. Kilcourse, LL.B., Chicago, Ill., Chief Bureau of Food Inspection, Department of Health
- Benjamin S. Kline, M.D., Cleveland, O., Sero Diagnosis of Syphilis
- Lillian M. Lecinski, R.N., Detroit, Mich., Supervisor Hamtramck Board of Health
- Laban W. Leiter, D.Sc., Baltimore, Md., Laboratory Director, Fairfield Farm Dairy, Inc.
- W. A. Mansfield, M.D., Barberton, O., Health Commissioner
- Ruby H. Manter, A.B., Minneapolis, Minn., Bacteriologist in Charge of Branch Laboratory, State Department of Health
- E. B. Maynard, M.D., Major, M.C., U.S.A., Denver, Colo. (Assoc.)
- George H. Musselman, M.D., Chicago, Ill., Medical Director, The Peoples Gas Light and Coke Company
- Edgar H. Myers, M.D., South Bend, Ind. (Assoc.)
- Philip C. Pack, A.B., Ann Arbor, Mich., Allied with Physical Education (Assoc.)
- J. W. Payne, M.D., Willow-Wood, O., Health Commissioner
- Charles W. Pemberton, M.D., Houston, Tex., Supervisor of Hygiene, Public Schools
- Zula L. Powell, R.N., Fort Worth, Tex., Executive Secretary, Fort Worth-Tarrant County Tuberculosis Society
- William T. Pratt, M.D., Rockville, Md., Deputy State Health Officer
- Quaker Oats Company, Chicago, Ill., Sustaining Member
- Williamina M. Rayne, New York, N. Y., Assistant to Executive Secretary, American Public Health Association
- George A. Russell, M.D., Boonville, Mo., Health Officer
- Evelyn C. Schmidt, Chicago, Ill., Director, Bureau of Dental Health Education, American Dental Association
- Beatrice Short, R.N., New York, N. Y., Assistant Director, National Organization for Public Health Nursing
- A. C. Stokes, M.D., Omaha, Neb., Medical Director, Guarantee Fund Life Association Company (Assoc.)
- Kathryn R. Tirrell, Bridgeport, Conn., Director, Division of Laboratories, Health Department
- Fannie M. Titsworth, Nashville, Tenn., Student at Peabody College (Assoc.)
- Daisy B. Treen, B.A., Boston, Mass., Director of School Luncheons
- William Turnbull, M.D., Winnipeg, Can., Medical Health Officer
- William H. F. Warthen, M.D., Baltimore, Md., Director, Bureau of Child Welfare, City Health Department
- J. W. Weber, M.D., Woodsfield, O., County Health Commissioner
- Rollin D. Worden, M.D., Ravenna, O., County Health Commissioner

DECEASED MEMBERS AND FELLOWS

- W. E. Musgrave, M.D., San Francisco, Calif.
- S. H. Rantz, M.D., Placerville, Calif.
- Dr. Joas Amarante, Rio de Janeiro, Brazil, S. A.
- S. Weingrad, M.D., Mountaintale, N. Y.
- William Morris, Roselle Board of Health, Roselle, N. J.
- Joseph C. Elfers, M.D., Commissioner of Public Health, Sheboygan, Wis.
- Walter B. James, M.D., New York, N. Y.
- T. Howard Barnes, New York, N. Y.
- H. L. Leete, R.N., Brooklyn. Childrens Aid Society, Wave Crest Convalescent Home, Far Rockaway, N. Y.
- Charles E. Marshall, Amherst, Mass.
- Dr. J. Y. Porter, City Health Officer, Key West, Fla.

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

Diphtheria Death at Auburn—On January 9, Auburn experienced its first death from diphtheria since March 9, 1924. The victim was a 6 year old child who, according to the report received by the State Health Department, had not been immunized against diphtheria with toxin-antitoxin. A physician was not called early in the disease, and the antitoxin was not given until 2 days after the first call. Two younger children in the family were given protective doses of antitoxin, but two older ones who had been immunized some time before with toxin-antitoxin were not given any. All four remained well.—*Health News*, New York State Department of Health: V:13 (Jan. 23), 1928.

Potency of Toxin-Antitoxin—In spite of the practice of giving 3 doses of toxin-antitoxin to all new nurses at the Cook County Hospital there occurred during the period of approximately 18 months from January, 1926, to July 8, 1927, 29 cases of diphtheria. Of this number 10 nurses had had not less than 3 doses of toxin-antitoxin within 2 years and prior to 3 months before onset. Four nurses had received 3 doses of toxin-antitoxin within 3 months of time of onset. Twelve gave a history of having had no toxin-antitoxin or previous diphtheria. In 3 instances no data were available. It will be observed that there were 12 cases among those who had not had toxin-antitoxin, and 14 cases among those who gave a history of having had some toxin-antitoxin. The unprotected group consisted of 175 individuals, and the protected group included only 64. It is, therefore, evident that the percentage of those who contracted diphtheria was

greater in the protected than in the unprotected.

These facts led to the inauguration of tests for potency of the toxin-antitoxin preparation. Wide variations were found in the potency of commercial preparations now on the market, and in some instances there was even considerable difference among the lots made by the same manufacturer. The method used to determine potency was that adopted by the Hygienic Laboratory of the U. S. Public Health Service. The author recommends that when large numbers of toxin-antitoxin immunizations are to be done, it is advisable to make tests for potency on the particular lot of toxin-antitoxin to be used before work is undertaken.—Paul S. Rhoads, Commercial Preparations of Diphtheria Toxin-Antitoxin, *J. A. M. A.*, 90:254 (Jan. 28), 1928.

Record Forms—The Committee on Administrative Practice of the American Public Health Association has published for experimental use, 4 sets of record forms. These are for communicable diseases, laboratory, school medical inspection, and public health nursing. The nursing forms have been worked out by the National Organization for Public Health Nursing. In designing these forms the committee had in mind not only the desirability of keeping adequate records which would serve local needs and assist the health officer of the smaller community who feels the need of rigid economy, but which would, likewise, enable the administrator to accumulate figures which are essential to the application of the *Appraisal Form* as a measuring stick of the effectiveness of the communal health program.

The fact is appreciated that it will be quite impossible for a single suggested system of record keeping to be applied universally. Lack of uniformity in the laws of the various states, and in the activities and methods followed by health departments in the reporting and supervision of cases of communicable disease makes this impracticable. There should, however, be a record of all immunization treatments for diphtheria, typhoid fever, smallpox, etc.; epidemiological records for securing and preserving the essential facts regarding the major communicable diseases which have been reported and entry made on a suitable report card. In smaller cities and towns these are the only communicable disease records needed for the diseases of major importance. In the larger cities there should be added as a minimum a case record card, inspector's or placarder's record, nurse's record, and a summary record.

The various types of record forms used in public health laboratories may be conveniently listed under the following heads:

1. Accession Sheet, for recording the receipt of specimens in the laboratory
2. Identification Slip, for physicians or others submitting specimens
3. Examination Record, for an exact statement of all work performed on each specimen together with the result of such examinations
4. Report Form, for written reports
5. Summary Sheet, for showing the amount and kind of work done in the laboratory
6. Miscellaneous Record Slips, for convenience of the laboratory in keeping departmental records, record of parts of work, etc.

A form for recording health facts about individual school children over a period of years is also presented. It is prepared for schools in which the teacher has no professional assistance in caring for the health of her pupils. It is not meant to offer an alternative or a substitute to

professional health science. The purpose is to meet the situation in the best manner that is possible under existing circumstances wherein the teacher, for the most part, has no professional assistance. The committee feels that there are 4 main series of facts which should prove useful: (1) record of communicable diseases experienced, (2) record of immunization, (3) record of obvious physical defects, and (4) record of absences by cause.

The public health nursing record system includes:

1. Index Card
2. Family Folder
3. Maternity Service
4. Health Supervision Service
5. Morbidity Service
6. Extra Data
7. Nurse's Daily Report
8. School Service

The committee's report will be found in a publication of the Association consisting of 106 pages. Copies can be secured from the Association office at the rate of fifty cents each.

Cincinnati Goiter Resurvey—During the 1923-1924 school session a thyroid survey was made of 47,493 children in the elementary schools of Cincinnati. The first survey included 23,710 boys of whom 26.6 per cent showed thyroid enlargements, and 23,783 girls among whom 39.8 per cent showed thyroid enlargements. In 1927 the resurvey included 12,722 boys and 12,818 girls. In the resurvey the percentage of thyroid enlargements among the boys was 22.5. and among the girls 39.3. In general it may be said that the resurvey included the same children who were examined in 1923-1924. The author concludes that there is a lessened incidence of the disease and a considerable reduction in the number of goiters of moderate and marked degree, although the aggregate incidence of endemic goiter in 1927 was only slightly less than in 1924. It is

believed that iodized salt was a factor in the slight reduction of goiter, and other prophylactics may have exerted a favorable influence.—Robert Olesen, A Resurvey of Endemic Thyroid Enlargement in Cincinnati; *Pub. Health Rep.*, 43: 1113 (Jan. 20), 1928.

Measles In Institutions—Deaths from measles in institutions for children and for mental defectives have been responsible for from 3 to 26 per cent of the annual mortality from this cause in New York State, exclusive of New York City.

The average for the 8 years 1915–1922 was 10 per cent. Outbreaks accompanied by a large number of deaths have occurred only in institutions caring for children under 2 years of age and in

institutions for mental defectives. The author describes in detail the restrictive measures employed for the prevention and control of measles in institutions during the year 1923, there being 45 distinct outbreaks in 40 institutions with a total of 945 cases and 51 deaths. He concludes that convalescent serum will favorably influence the mortality if administered during incubation period, but admits that its use in the institutions was a decided disappointment. Delayed notification and difficulty in transportation detracted materially from its practical value as well as the difficulty of maintaining a reserve supply sufficient to meet the needs of a large institution.—Edward S. Godfrey, Jr., Measles in Institutions for Children, *J. Prev. Med.*, 2:1 (Jan.), 1928.

LABORATORY

C. C. YOUNG

DELETERIOUS EFFECTS FROM SERUM INJECTIONS

W. H. PARK, M.D., FELLOW A. P. H. A.

Director, Department of Health Laboratories, New York, N. Y.

BEFORE considering these effects individually it will be well to review briefly our present knowledge as to the reason of the development of the reactions in susceptible individuals.

Hypersensitiveness in man may be observed after both the enteral and parenteral introduction of many and varied substances. These inducing substances may be divided into two groups, antigenic and non-antigenic, viz: those which stimulate and those which do not stimulate the production of demonstrable antibodies. The degree of response to such substances is largely personal idiosyncrasy and the symptoms, however diverse the agent, have a great deal

of similarity. Coca has suggested that the term allergy, introduced by von Pirquet, be limited to describe these individual peculiarities.

Because of the ease with which experimental animals may be rendered sensitive or anaphylactic, there has developed a general fear of a fatal outcome following injections of antitoxins and antisera made some weeks or years after a previous injection. There is, however, direct evidence that man is much less liable to be similarly sensitized. In this connection it should be noted that attempts to render monkeys anaphylactic have failed. Longcope believes that the high degree of susceptibility in

some people with spontaneous sensitiveness, the multiplicity or lack of specificity of sensitivity and the distinct tendency to occur in families differentiates these individuals from the artificially sensitized. Man may be sensitized in a way as manifested by the accelerated or immediate reactions of serum sickness, the production of chills and fever by intravenous injections, or by the development of an increased skin sensitivity after serum administration.

Collapse or death has occasionally followed the second injection of antitoxin or antiserum, and seemingly is more likely to occur after intravenous or intraspinal injection where an interval of five days or more has elapsed after the first injection. These occurrences suggest that some individuals may actually be rendered anaphylactic. On the other hand, different lots of antitoxin and antiserum behave distinctly differently, and individuals of known sensitivity do not necessarily always react similarly to the substance to which they are sensitive. The danger of second injections to an individual is probably only slightly greater than that of first injections.

SERUM REACTIONS

The untoward symptoms elicited in man by the introduction of serums with or without antitoxins may be divided into those following the initial injection and those following the second or later injections. These reactions have nothing to do with the antibody content of the injected serum.

Following the first injection three types of reactions may be noted: (a) most frequently, a symptom-complex called "serum sickness"; (b) very rarely, collapse, with or without fatal outcome; (c) equally rarely, local necrosis. Each of these forms of response may follow the second or later injection.

Collapse or Death—This rare accident

has been noted usually after the first injection. The symptoms develop quickly after the administration of the serum. In about 1 to 20,000 persons receiving primary injections of serum alarming symptoms develop; in about 1 to 50,000, death results. The symptoms are those of extreme dyspnea and collapse. The dose which will give alarming symptoms or even result fatally may be very small. Kerley reports a case of known hypersensitiveness where the dose was gradually increased until 4 minims were given; this resulted in alarming shock. It is probable that the greater frequency of deaths after first injections was because the number of first injections was so much larger. The individuals showing this type of reaction are commonly those subject to "hay fever or asthma" developing attacks especially in the neighborhood of horses. Children having a status lymphaticus are prone to develop collapse or die. Every precaution should be taken in giving antitoxins or antisera to such cases or to those subject to asthma.

Chills—A chill more or less severe is observed in about 10 per cent of the cases after the intravenous injection of refined antiserum and about 20 to 60 per cent of the cases after unrefined antiserum, even when injections are given very slowly and the material warmed to the body temperature. In the Willard Parker Hospital the frequent administration of antitoxin by the intravenous method has revealed that this probably depends on some special form of the protein or lipid. With the best product of refined antitoxin globulins less than 1 per cent of intravenous injections produce a chill. There is considerable difference in this respect between different preparations of both refined and unrefined serum.

It should be emphasized that the development of sudden collapse is the condition to fear and prevent. Serum

sickness is not fatal in itself, however alarming in appearance and uncomfortable the condition may be; even where two or even three successive waves of rash and edema ensue. This condition cannot be prevented except by improvements in concentration methods, which will both modify and lower the content of protein substances in antitoxin and other antibody preparations. The giving of divided doses does not materially influence the subsequent development of serum sickness as roughly the total quantity given is the determining factor in individuals of equal sensitiveness and with the same preparation of antitoxin.

Serum Sickness—The incidence of this type of reaction varies widely in different series of cases, being from 10 to 60 per cent or more according to the preparation of serum used. The size of dose will influence to some degree the percentage incidence. Because of the lower protein content and also because of the heating, the concentrated globulin preparations of antitoxin cause a relatively low incidence. Following the first injection of serum or antitoxin there is an incubation period varying from 3 hours to 24 days. More commonly the period ranges from 3 to 12 days. The symptoms are primarily a skin eruption, edema, slight albuminuria, variable both in incidence and in degree, enlargement of the lymph nodes with pain and tenderness and pain in the joints. The eruption is very variable in character. A local eruption usually appears earlier than the general eruption. On the second or later injections the period of incubation may be absent or shortened, "immediate or accelerated reaction," although this does not always occur. This accelerated reaction is not more serious than the ordinary serum sickness. Some samples of unrefined serum uniformly cause skin eruptions (scarlatinaform) earlier than others. The longer incubation periods are more frequently followed by urti-

carial rashes. It would seem from this that there were different reaction-inducing substances in serum or antitoxin.

Severe Local Reactions—In very rare instances the primary injection of antitoxin leads to local necrosis. Although this occurs with extreme infrequency, it should be a warning against injection under the breasts. When repeated injections are given, a second or later subcutaneous injection somewhat more frequently results in a sharp local reaction which may go on to necrosis. This may occur not only with serum but also with rabies vaccine. The resemblance of this form of reaction to the Arthus's phenomenon in sensitized rabbits is marked. The necrosis is not due to bacterial contamination, but the necrotic area may become infected and serious or fatal results ensue.

TESTS USED TO INDICATE THE PROBABILITY OF SERUM REACTIONS

While it is always advisable, in general it is not expedient, to test the sensitivity of every case before the administration of antitoxins or antisera. Careful inquiry should be made as to known allergy, such as hay fever, asthma or food idiosyncrasies. Those giving a definite or suspicious history may then be tested by the intracutaneous injection of about 0.1 c.c. of serum, or antitoxin diluted 1 to 10, or the instillation of a drop of the undiluted serum, or a 1 to 5 dilution in the eye.

It is important that epinephrine be immediately available when doing an ophthalmic test since in rare instances a severe reaction has occurred. The instillation of epinephrine will check the progress of the reaction. Of the two tests, the latter is the more reliable index of the probability of a serious general reaction, but because of crying it is somewhat difficult to use accurately in young children, both because it is partly washed out and because of congestion of the conjunctiva in the other eye.

Untoward results may occur in persons not giving a positive test. The presence of skin sensitiveness, as shown by the prompt development within 20 minutes of a definite wheal at the site of intracutaneous injection which is considerably larger than the original wheal made by the injection, usually indicates that serum sickness with local or general rash will develop, and more quickly than usual. The late area of hyperaemia which develops at the site of the injection is of little if any significance. Children which show this late reaction from an intradermal injection of the serum from one horse often will not react to the serum from another horse. The rare cases with symptoms of shock with or without death are more likely to occur than in those not skin sensitive. The eye test seems to be even a better index of the probability of a serious reaction.

In those where because of history or preliminary test or both there is reason to fear a general reaction, about 0.05 c.c. of serum or antitoxin may be given subcutaneously, and then gradually increased-sized doses, such as 0.1 to 0.2 c.c., given every 15 minutes until a slight reaction indicates that the tolerance of the patient is reached or sufficient serum is given. Should an intraspinal or intravenous injection be required, it becomes a problem of comparative dangers of withholding the serum or risking the reaction. Several preliminary subcutaneous injections may be tried (as above) before attempting intravenous injection, giving then only a very small amount, pausing for some minutes, and then giving the remainder very, very slowly. Dilution with saline solution wherever possible is an aid in this regard.

Even with all these precautions a severe reaction or even a fatal result may occur. Thus, a young woman, who had received 80 c.c. of antistreptococcic serum intramuscularly, required at the

end of 3 weeks an intravenous injection. She was given at short intervals 0.5, 1, 2 and 4 c.c. of serum subcutaneously. No appreciable local or general reaction occurred. An intravenous injection was then given. When the amount reached 10 c.c., while it was being administered very slowly, she complained of premonitory symptoms of beginning shock. The injection was immediately suspended, but the symptoms increased and death soon resulted. The first injection of serum, although it produced no immediate effect, did cause serum sickness on the 8th day. Such cases are fortunately rare.

DESENSITIZATION TO SERUM

Instances are noted with some frequency where first injections have caused reactions and following injections given several hours or even a day later have produced little or none. This would seem to indicate a desensitization. Different batches of bactericidal or antitoxic serum will vary widely in their rash and temperature producing qualities, and this may have been a factor in the development or non-development of symptoms. The administration of small doses of serum, prior to a first large injection or prior to subsequent injections of those known to be sensitive, has not the regularity of desensitization noted in experimental animals. Divided doses may fail to give a reaction or repeated small doses may apparently induce a tolerance, but this is no proof that we are inducing the mechanism of desensitization so uniformly producible in experimental animals. In persons suffering from lobar pneumonia where frequent injections of antiserum are given intravenously the first injection of serum frequently produces a chill. Subsequent injections of the same dose rarely produce one, but if the dose is markedly increased a second chill frequently follows. Even the same amount

of a different preparation is more apt to produce a chill.

METHODS OF ELIMINATING THE REACTING SUBSTANCES FROM ANTISERUMS

Concentration methods (globulin separation) have had effect in reducing the incidence of rashes. Heating the antisera to 56° C. before concentration is of distinct value; likewise the preliminary saturation with sodium chloride and the use of the clear filtrate for the subsequent steps in the ammonium sulphate method of purification. Aging of antisera or of globulin preparations is of distinct value. Crystal clear products are less likely to cause chills and the aging before filtration is more likely to yield a product which will remain clear. Starving of horses prior to bleeding does not seem to influence the content of reacting substances. Keyes and Carey advise the addition of calcium chloride and cephalin to remove the residual fibrin-forming substances still remaining after clotting. They believe that chills may be prevented in this way. In a little preliminary work we have not been able to remove the chill-producing substance by utilizing what we believed to be their method.

TREATMENT OF DEVELOPED SHOCK

Hypodermic injection of epinephrine or atropine will usually relieve the less severe attacks. In extreme collapse artificial respiration may be tried.

EFFECT OF THE SERUM IN TOXIN-ANTITOXIN IN SENSITIZING HUMAN BEINGS TO LATER INJECTIONS OF SERUM

Let us first approach this subject from the experimental side. It has long been known that minute quantities of serum will sensitize guinea pigs so that they will show some reaction after a delay of several weeks to later doses of serum. It is not usually remembered, however, that these small doses frequently do not sensitize guinea pigs to the extent that

any appreciable reaction follows from large intracardial injections of serum. Recently we have given a number of guinea pigs several times the proportional amount of serum which human beings would get from toxin-antitoxin and none of these guinea pigs have died from 1 c.c. of serum injected intracardially. Several showed no symptoms at all; others had slight spasmodic contractions, scratched their nose and showed evidences of slight anaphylactic shock. They all made good recoveries.

Further it should be remembered as already stated, that the guinea pig is far more susceptible than other animals and so probably far more so than man. If we turn to skin reactions, we find as first pointed out by Hooker that after intracutaneous injections of 0.1 c.c. of a 1 per cent horse serum and 3 injections of the old toxin-antitoxin mixture, that these persons showed a year later a marked increase in the number which reacted to a second intracutaneous serum test.

It should be noted that not only did Hooker use a preliminary injection of serum which contained more serum than the 3 injections of the present toxin-antitoxin mixture, but he also used the old preparation of toxin-antitoxin which contained thirty times as much serum as the present mixture. Repeating his tests on children that had not received a previous intracutaneous injection, I found that there was only a moderate increase in the percentage of skin reactions among those who had received toxin-antitoxin and that none of these were extensive reactions.

From long experience in using preliminary intracutaneous tests to discover those who might show anaphylactic shock, we have learned that only those skin reactions which are extensive suggest the probability of anaphylactic shock or severe accelerated reactions. Those that show minor skin reactions as well as those that show no skin reactions

may develop anaphylactic shock, but do so less frequently. Then we have the final test as to whether a given number of persons who have received 3 injections of the present toxin-antitoxin mixtures show more accelerated reactions or serious cases of serum sickness or true anaphylactic shock or necrosis than those who have not received these injections.

I have had the opportunity of making a comparison in more than 100 individuals who had received toxin-antitoxin and in more than 100 individuals who have not received toxin-antitoxin. The total number of children was obtained by combining several different tests on different groups. In my experience there was no appreciable difference in the reactions following serum injections in those who had toxin-antitoxin and in those who had not. If isolated cases in which marked reactions occur which happen in those who had toxin-antitoxin previously are reported, it is misleading because similar cases could be reported in those which have not received such injections. It is only by comparing the two lots that accurate information can be obtained.

A striking instance of this was the recently published case of necrosis in a

nurse following a second injection of antitoxin which followed ten days after the first injection. The caption over this report was gangrene following an injection of serum in a case which had previously received toxin-antitoxin. We know that an injection of serum following another given 10 days previously not infrequently is followed by a reaction, while the fact that the first injection of serum gave no reaction definitely rules out the toxin-antitoxin given a year previously as being in any way responsible.

There was recently reported to me the case of a young girl who nearly died after a dose of scarlet fever antitoxin. She had not had toxin-antitoxin or any previous serum injection. If she had had, it would have been considered as the predisposing cause.

From my own observations I am not at all worried by the slight degree of skin sensitization which may be produced by toxin-antitoxin. Fortunately, if anyone is worried we can turn to goat toxin-antitoxin or to toxoid. These preparations when they are properly made and when they have successfully passed tests for immunizing potency are equal in value to toxin-horse-antitoxin. This we are doing in New York and probably this change will in time become general.

VITAL STATISTICS

LOUIS I. DUBLIN, PH.D.

The Appendicitis Record of 1926— The mortality from appendicitis in the registration area of the United States has increased steadily since 1900, when there were 9.7 deaths per 100,000 to 11.4 in 1910, 13.4 in 1920 and 14.9 in 1924. The rate has risen much more slowly in England and Wales from 6.7 in 1915 to only 7.4 in 1925. Since the mortality from normal operations should not exceed 2 per cent, early operations would seem to be of utmost importance in

lessening our mortality from this disease.

The urban death rate in this country has increased from 13.3 in 1910 to 15.6 in 1920, and 17.3 in 1926. In 22 cities of between 50,000 and 375,000 population the average rate was 15.7. Several of these cities reported no deaths, but Little Rock, Ark., had the exceptionally high rate of 61.9. In 116 other cities of more than 20,000 population the average death rate was 17.0 in 1925 and 17.3 in 1926. For disease increase in 65 of these cities

the lowest rate was 0.4 in Indianapolis, Ind., in 1926. The cities with the highest rates were Schenectady, N. Y., 30.1, Denver, Colo., 30.9, Knoxville, Tenn., 31.4, Columbus, O., 32.6, Spokane, Wash., 33.0, Nashville, Tenn., 33.6, Springfield, Ill., 35.5, Petersburg, Va., 35.7, Sacramento, Calif., 36.8, Salem, Mass., 39.6 and Lincoln, Neb., 46.8.—Frederick L. Hoffman. *Spectator*. 120: 11, 29-30. (Jan. 5), 1928.

Vital Statistics of Toronto, Ont., 1927—A review of the vital statistics for the past year shows the general mortality rate for Toronto to be 11.0 per 1,000 of population. This rate is slightly lower than in 1926, and a shade higher than the average annual death rate of the past 5 years, which is 10.7. Some idea of the progress that has been made can be gained when one realizes that the death rate 18 years ago was 15.3. The birth rate for the city, which has been steadily decreasing from the highest rate recorded, 30.9 in 1913, the year immediately preceding the Great War, shows a slight increase over the lowest rate on record, 21.3, a year ago. The rate this year is 21.7, and represents a total of 12,340 live births that were registered.

An infant rate of 158.5 per 1,000 live births (corrected) in 1909 has been lowered by preventive measures, to a rate of 58.8 in 1927, the lowest rate for the city recorded. This is a reduction of almost 63 per cent. The number of infant deaths registered in 1927 was 853, compared with 868 a year ago. The chief cause of death among infants was prematurity, which shows a slight increase over the figure of 1926. An increase is shown this year in gastrointestinal diseases under 1 year, 93 such deaths being registered. In 1913 over 500 deaths occurred from this cause. Decreases are shown in the number of infant deaths from pneumonia, congeni-

tal debility, tuberculosis and acute communicable diseases, compared with 1926.

—The number of deaths from all forms of tuberculosis in the past year was 351; in 1926 there were 329 deaths registered. The mortality rate is 61.6 per 100,000 population, slightly in excess of last year. The reduction made in the tuberculosis death rate has been remarkable, when we compare the rate of 130 in 1910 to the lowest rate on record, 59.0 in 1926, a decrease of almost 55 per cent. The so-called degenerative diseases, organic heart disease, cancer, diseases of the arteries, cerebral hemorrhage (apoplexy), and nephritis (Bright's disease), accounted for approximately 40 per cent of all deaths registered. An increase is shown in all these diseases compared with a year ago, with the exception of nephritis. Fewer deaths were registered this year from pneumonia and influenza. A decided increase has been shown in the number of cases reported to the Quarantine Division of acute communicable diseases, with the exception of whooping cough. Increased mortality, however, is only shown in scarlet fever and diphtheria. Six deaths were due to typhoid fever, compared with 8 a year ago. One death was registered from smallpox, the first since March, 1924. Ten deaths were due to measles, a decrease from a year ago of 2. Twenty deaths from whooping cough, a decrease of 17. Diphtheria accounted for a total of 112 deaths, compared with 89 in 1926.—Dept. of Public Health, Toronto. *Monthly Report*. p. 1-2 (Dec.), 1927.

Vital Statistics in France—The Health Organization of the League of Nations has issued a handbook which deals with the procedure followed in gathering the official vital statistics of the French Republic. The census is taken quinquennially and is planned,

first, to enumerate the legal population for purposes of government and taxation and, second, to ascertain specific data of all persons. Since 1896 the alternate censuses have concentrated on civil condition and occupation, but in 1921 the census included both. The census agents are appointed by the mayors of the communes and are each responsible for a district containing from 100 to 200 persons.

Births of living children must be declared to the registrar within 3 days by the father, doctor or some other appropriate person under penalty of fine or imprisonment. Stillbirths must also be declared and there are special provisions for the recognition of illegitimate children by the parents. Deaths must be declared to the registrar by a relative of the deceased or other appropriate person. Declaration is commonly made within 24 hours, although no time limit is prescribed. The body must in all cases be viewed by an authorized verifier and an "acte de deces" drawn up by the mayor of the commune or his deputy. The acte contains no information as to cause of death, but the registrar in most communes submits to the mayor a special bulletin which among other facts gives the cause of death. But since the medical practitioner in attendance is not required to give a certificate as to cause of death the official records of the verifier vary in reliability. These bulletins are transmitted by the mayor through the prefect of the department to the General Statistical Office where they are published in the *Statistique du Mouvement de la Population*.

There are 18 infectious diseases which are compulsorily notifiable and 9 others which are optional. Notification must be made immediately and in duplicate by the medical practitioner, public health officer or midwife to the prefect of the department and the mayor of the commune. In order to insure professional secrecy the disease is referred to

by number only. A register of notifications is kept by the prefect who sends a monthly summary to the Department of Health of the Ministry of Labor, and a general statement based on the summaries is published annually. A bacteriological laboratory is provided free of charge for medical practitioners in most departments and large towns.

Disinfection, free of charge, to poor persons and on a sliding scale of expense to others, is absolutely required in compulsorily notifiable diseases. Vaccination and revaccination are compulsory. There are 500 dispensaries and 54 sanatoriums with 7,000 beds for tuberculosis, one of the optionally notifiable diseases. For venereal disease, which is not notifiable, there are dispensaries and special facilities for pregnant women, nursing mothers, soldiers, sailors, prisoners and prostitutes.—*Brit. M. J.*, 2:1198-1199. (Dec. 24), 1927.

Vital Statistics of Ghent, Belgium, 1926—The report of the Municipal Bureau of Health of Ghent for the year 1926 gives the population of the city as 162,641. There were 2,356 births during the year as compared with 2,471 in 1925, the rates being 14.41 per 1,000 population in 1926, and 15.08 per 1,000 in 1925. There were 2,078 deaths in 1926 as compared with 2,123 in 1925. Deaths among children under 1 year were 213 in 1926, as compared with 260 in 1925.

The principal causes of death in 1926 were cancer, 226 deaths, and pulmonary tuberculosis, 116. Forty-eight cases of typhoid fever were reported with 4 deaths; 51 cases of scarlet fever with no death; 44 cases of diphtheria with 2 deaths; and there were 6 deaths from whooping cough. One case of puerperal fever and one of cerebrospinal meningitis were reported, but there were no deaths from these diseases. It is said that smallpox has not appeared in Ghent for a number of years. Forty-nine cases of

gonorrhea and 2 of syphilis were discovered and segregated.—*Pub. Health Rep.*, 42:3099 (Dec. 16), 1927.

Vital Statistics of 67 American Cities, 1927—The general death rate for these cities in 1927 was 12.3 as compared with 13.2 in 1926. The three highest death rates occurred in cities having large negro populations. Memphis led with a rate of 19.3; next came New Orleans, 18.7, and Nashville, 17.5. The lowest rates were 9.2 in Somerville, and 9.3 in Yonkers. The highest rates in 1926 were found in the same cities as in 1927, Memphis 20.0, Nashville 19.7 and New Orleans 18.9. The lowest rates were in Seattle, 9.7 and in Yonkers and Canton each with 10.4.

In 1927 the infant mortality rate was 62 and in 1926 it was 72 per 1,000 live births. The highest rates in 1927 were 87 in Lowell and 85 in New Orleans; in 1926 the highest rates were 107 in Richmond and 102 in New Bedford. The lowest rates in 1927 were 36 in St. Paul and 37 in Seattle, in 1926 they were 39 for Portland, Ore., and 46 in San Diego. *U. S. Weekly Health Index*. Summary for 75 cities, 1927.

Vital Statistics of Syracuse, N. Y., 1927—The general death rate in Syracuse for 1927 was 12.3 as compared with 13.3 for 1926. The infant mortality rate was 57.3 as against 69.2 in 1926. Of the 6 principal causes of death, only cancer and nephritis showed slight increases. The tuberculosis mortality rate of 59.0 was the lowest rate of any large cities in the United States. There were 584 deaths from heart disease in 1927, from cancer, 242, from pneumonia 206, from nephritis 195 and 169 from cerebral hemorrhage.

There were 14 deaths from measles, 3 each from diphtheria, scarlet fever and typhoid fever. These deaths from typhoid fever were traced to a typhoid carrier in the city. There were 168

deaths from violence in 1927 as against 176 in 1926. The total number of deaths from tuberculosis and all the acute infectious diseases, with the exception of pneumonia, was much less than those from violence.—*Syracuse Better Health* (Monthly) 2:2-3 (Jan.), 1928.

Statistics of Attendants at Birth in Pennsylvania—Hospital births comprised only 19 per cent of all births in Pennsylvania during 1926 but in Philadelphia 41 per cent took place in hospitals. Twenty per cent of native born mothers in the state went to hospitals for confinements, 36 per cent of colored mothers and 14 per cent of foreign mothers had hospital care. The high percentage of hospital confinements among colored women is partly explained by the fact that most colored people in Pennsylvania live in cities with easily accessible hospital facilities.

Seventy-four per cent of births occurred in the home of the mothers and were presumably attended by physicians while 7 per cent were attended by midwives. More than 60 per cent of the mothers attended by midwives were foreign born. Of all births among foreign born mothers 22 per cent were midwife births but only 4 per cent of native born white and colored mothers employed midwives. Midwife births were highest among those of Polish birth, and next among the Austro-Hungarians. The Irish, Italians and Germans employ midwives for from 10 to 20 per cent of the births. Russian and British mothers are rarely attended by midwives.

There were 4,681 illegitimate children born in Pennsylvania in 1926, amounting to 2.2 per cent of all births. Illegitimate births made up 9.5 per cent of all colored births, 2.7 per cent of the children of native born mothers and 0.6 per cent of children of foreign born mothers.—*The Hurray Call, Pennsylvania's Health*. 6:29-30 (Jan.-Feb.), 1928.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C.E.

SEWAGE SLUDGE*

C. B. HOOVER, FELLOW A. P. H. A.

Columbus, O.

AFTER more than one-third of a century of practice of the art of sewage treatment in the United States, the disposal of sludge holds the center of the stage as a most troublesome and exasperating problem.

Sewage solids, deposited in a settling tank, and not properly digested before being withdrawn, are very apt to create a decided odor nuisance. If digestion has been satisfactory, but the sludge drawn from the tank has a high moisture content, then the problem of dewatering is presented inasmuch as this step must be taken ordinarily before final disposal can be made.

There have been three general means employed for the final disposal of sewage sludge; namely, (1) discharging it in deep water of a lake, sea or ocean where it will not create a physical nuisance or be otherwise objectionable; (2) spreading it upon farm land with the idea of utilizing any fertilizing value it may have; and (3) using it for making fills.

In every community where sewage treatment is practiced, there are citizens and public officials, who, because of their interest in public affairs, want to know why sewage sludge cannot be used as a fertilizer and possibly become a source of revenue.

No effort will be made in this paper

to give a definite answer to this question. However, a better perspective of the problem and its limitations may result from a study of the results of 16 years of experience by the City of Columbus, O., in the recovery of salable products from another municipal waste, namely, garbage.

During the period from 1911 to 1926, both years included, 361,773 tons of green garbage were reduced, resulting in a recovery of 8.8 per cent of the original green garbage tonnage as tankage or fertilizer, and 2.5 per cent as grease. The total revenue from the sale of by-products was \$1,367,679 and the total cost of operation (\$1,183,040), interest on bonds (\$198,450) and free water (\$126,076), was \$1,507,566.

The total revenue per capita per year was 36.8 cents, and the average cost of operation, interest and free water per capita per year was 40.6 cents, making the net cost per capita per year, not including depreciation, 3.8 cents.

The costs referred to above include the cost of transportation of the green garbage from a central loading station to the reduction works but do not include the collection cost.

If a proper depreciation charge were added, the average net cost per capita per year would be approximately 10 cents, and although this plant has not been a net producer of revenue, its operation has provided a very cheap method of garbage disposal.

A further study of this recovery

* Presented to the Public Health Engineering Section of the American Public Health Association, at the Fifty-sixth Annual Meeting at Cincinnati, O., October 18, 1927. (See Report of Committee on Disposal of Sewage and Industrial Wastes, *A. J. P. H.*, Feb., 1928, p. 199.)

process shows that of the total revenue for the 16-year period, 73.0 per cent was derived from the sale of grease, 24.5 per cent from the sale of tankage or fertilizer, and 2.5 per cent from other miscellaneous sales, such as hides, etc., and a still further analysis of the salable products shows that the contributing elements were approximately as follows:

	Per cent
Grease	73.0
Nitrogen	20.0
Phosphorus and potassium	4.5
Other products	2.5

The above data show that grease and nitrogen recovery accounted for 93.0 per cent of the revenue derived from the sale of the by-products of garbage reduction.

The average pounds of green garbage per capita per year for the 16-year period was 195, and of this amount 80 per cent is moisture and ash and 20 per cent combustible matter. Inasmuch as the combustible matter furnishes the grease and nitrogen which account for 93 per cent of the salable by-products, consequently the valuable recovery products are produced from 20 per cent of 195 lbs. or 39 lbs. of dry material per capita per year.

For purposes of comparison it will be assumed that average municipal sewage has 200 p.p.m. of suspended solids; that the entire amount is removed by the treatment process and recovered as sludge; that the sewage flow is 100 gals. per capita per day; and that 40 per cent of the total suspended solids are fixed, and 60 per cent volatile.

Under the above assumptions the combustible matter in sewage per capita per year would be 200 p.p.m. x 100 gals. per capita per day x 365 days x $8\frac{1}{3}$ lbs. per gal. x 0.60 divided by 1,000,000, or $36\frac{1}{2}$ lbs.; or in other words, on the basis of the assumed conditions, taken as average for municipal sewage, there is less dry combustible matter in sewage per capita per year than there is in garbage.

The above estimate of $36\frac{1}{2}$ lbs. contemplates a complete recovery of the suspended solids, whereas very material losses will occur from at least three sources; namely, a portion disappearing as a result of digestive processes, another portion being unrecoverable because of its finely comminuted condition, and a third portion passing out with the final effluent of the works.

There is also a marked difference in the quality of the ether soluble material in sewage sludge and garbage. The unsaponifiable material in garbage grease is less than 3 per cent, and the grease from sewage sludge has been reported by one investigator to have an unsaponifiable content of from 7 to 14 per cent, and others have placed it as high as 20 per cent.

The average amount of grease recovered from garbage at Columbus for a period of 16 years is 4.8 lbs. per capita per year, and the average selling price is 5.65 cents per lb. The average amount of grease in sewage is somewhat speculative inasmuch as fat determinations are not a part of the analytical routine in sewage works laboratories. During the experimental investigations in Columbus in 1904 and 1905, fat determinations were a part of the routine analysis and the average value secured at that time indicated a fat content of about $7\frac{1}{2}$ lbs per capita per year; however, the hardness of the city water at that time was about three times the present hardness, also the use of automobiles had barely started at that time.

About ten years ago, $15\frac{1}{2}$ tons of air dried sewage sludge were put through the drying process at the garbage reductions works with the results shown on the next page.

The composition of the dryer sludge was, ammonia 1.86 per cent, potash 0.11 per cent, tri-calcium phosphate 2.72 per cent; and the selling price of this dryer sludge at present-day prices would be \$3.88 per ton.

Total weight of air dried sludge	15.5 tons
Moisture in air dried sludge	24.8 per cent
Total weight of dryer sludge	6.5 tons
Moisture in dryer sludge	3.4 per cent
Total loss in drying treatment	9.0 tons
Moisture loss in drying treatment ...	3.6 tons
Loss of other constituents	5.4 tons
Per cent dry recovered sludge was of original air dried sludge	42.0.

It is probable that the method employed to dry this sludge caused a material loss of nitrogen and was not the best way of doing it.

The per ton selling price of garbage tankage for the 16-year period has been as follows: average \$10.45, maximum \$22.65, minimum \$6.96. The prices

received in recent years for garbage tankage are as follows: 1924, \$9.35; 1925, \$8.86, and 1926, \$8.20.

Columbus has a present population of approximately 295,000, with a wide diversity of industries, none of which produces wastes unusual in quality or particularly large in quantity. The sewage of the city is probably of average domestic industrial composition.

In conclusion it would seem that, under the conditions just reviewed, an attempt to recover valuable products from sewage sludge is not a promising undertaking and that the proper criterion is in finding the cheapest and most satisfactory means for its final disposal.

Study of the Waste Water of Paper Mills—The author reports a number of studies and experiments made by himself on waste waters from paper mills in an effort to determine the significance of this particular industrial waste as affecting the health of the population in certain areas, its effect on fish life in streams into which it is discharged, and its possible application to soil as a fertilizer-carrying irrigation water.

Three kinds of waste were experimented with which the author designates as I, II, and III as follows: (I) Straw and lime, or paper board refuse; (II) manila hemp, *Broussonetia Kashinoki*, Sieb and other materials used in the making of Japanese papers; (III) wastes in which above two are combined.

Interesting charts and tabulations of the detail technic are given covering each type of experimental study and the author's conclusions are given below:

Effects of Waste Water on

1. **Pathogens**—This experiment was limited to a study of the effect of paper mill waste on *B. typhosus*, cholera vibrio and dysentery bacilli. No apparent germicidal power was noted in fluids I and III, but fluid II destroyed the cholera vibrio in 8 hours, typhoid bacilli in 4 to

8 hours and dysentery bacilli in 2 to 4 hours when used in its original form (without dilution). Diluted to one-half strength cholera spirilla were destroyed in 8 to 18 hours, typhoid bacilli in 8 hours and dysentery bacilli in 4 to 8 hours by fluid II.

2. **Fishes**—This series of experiments indicates that "fish die in the waste water when the latter decomposes to degeneration"; it does not destroy them in a short time; and "that the fish which lived long in such waste water acquired some peculiar odor and was unfit for eating."

3. **Animals**—Rabbits were used as the experimental animals and it is interesting to note that the animals fed with fluid I and fluid II showed a gain in weight of from 31 to 78 g. more than control animals which were caused to drink "plain water."

4. **Plants**—The author assumes that paper mill wastes should be an excellent medium for the fertilization of growing crops when used for irrigating land since it contains the essential elements of plant food and is "almost free from injurious elements."

Unfortunately, his experimental rice field was attacked and destroyed by rats

during the course of his experiment and the continuation of this study is left to the Prefectural Experimental Firm under the guidance of which the Seihl Paper Mill is now conducting similar experiments.

Experiments on Decolorization of Waste Water—A considerable number of experiments were conducted with different chemical agents and varying dilutions of the waste in order to determine the most effective method of accomplishing decolorization. Local inhabitants appear to object more strenuously to the filthy appearance of water polluted by such waste than to its actual chemical composition. The author concludes that "decolorization by means of sodium bisulphite and dilute sulfuric acid cannot be thoroughly effective."

Experimental Dilution of Waste Water—Dilutions of paper mill waste of varying strengths from 1:100 to 1:600 were made of fluids I, II and III and the dilutions examined as to appearance, odor, reaction, and analyzed for the presence of sulfuric and nitric acids, ammonia, chlorine, lime and organic matter. These experiments are carefully tabulated.

The conclusion is that "said waste water becomes drinkable if diluted to 600 times with distilled water, and 700 times with water from the river Matsubara."

Course Taken in Decomposition of Waste Water—This series of experiments was made to determine the effects of dilution alone on the putrescibility of waste waters. It was observed that while the original fluid decomposed and changed color by the third day, 1:5 dilution on the 10th day and 1:10 on the 15th day, "It was also seen that in the progress of decomposition much depended on temperature and sunshine." A dilution of 1:20 never decomposes or changes, even in the month of August.

The Effect on Sanitation of the Districts along the River to Which the Waste Waters Flow In—(1) Mosquito

breeding is increased and breeding season prolonged. (2) Fishing, swimming, and such recreations are interfered with or made impossible. River is changed from beautiful, clear stream to one of filthy, foul, malodorous character with its beauty spoiled. Fish are entirely destroyed. (3) A variety of gases are generated in the water. Air along the river bank contains 1 part per 3,000,000 of hydrogen sulfide. The foul odor varies according to the day, hour and place.

It is the author's opinion that some means should be devised for using paper mill waste for fertilizer unless it can have a dilution in the stream receiving it of at least 1 to 500.—Natsuhiko Watanabe. *J. Pub. Health Assn. of Japan*, 3:1 (July), 1927. Abstr. C. H. Kibbey.

Direct Microscopic Examination of Milk—The article describes detailed experiments by the authors to determine value of direct bacterial count of milk as evidence of its sanitary quality.

Ten c.c. samples were centrifuged, a smear on slides made of sediment and this defatted, fixed, clarified, stained and examined under X900 magnification. Comparisons of direct count results, with field examination of cows suffering from mastitis, showed close relation between the two.

Dilution tests of certified milk contaminated with milk from infected cows indicated that it could be detected in high dilution.

Examination of dairies and market milk was begun and the direct counts found to parallel the conditions of the cows and sanitary conditions of the dairy. This visible method roused the interest of the dairymen, secured their coöperation and resulted in improved relations between inspectors and dairymen.—LeRoy Forman and I. H. Shaw. *Health News*, N. J. State Dept. of Health, 12:143 (May), 1927. Abstr. J. R. Hoffert.

The Volga, Oka and Moskowa Rivers as Sources of Supply of Potable Water for the City of Moscow—The water supply of the city of Moscow comes from two places: the underground stream of Mytizchy provides 25,000 cu.m. per day, and 170,000 cu.m. per day are taken from the River Moskowa.

The population of Moscow being, according to the last census, over 2 million, the supply is only sufficient for the metropolitan area. It is estimated that, in 1950, 630,000 cu.m. will be required, and in 1933 that 300,000 cu.m. will be required to supply the environs of Moscow as well. The Moskowa cannot supply more than 260,000 cu.m. per day; so a commission was appointed to find other sources of supply. Two other rivers, the Volga and the Oka, were investigated. As the distance from these rivers was 100 km. they appeared impracticable for this purpose, a more practical solution seeming to be the impounding of the Moskowa to provide a constant supply and to lessen the risk of floods as well. Nevertheless, tests of the waters of the Volga and of the Oka were made, with recommendations as to their use. It was considered that because of the origin of the waters of the Moskowa, it would cause great trouble due to algal growth, and the necessary measures to provide a potable water if reservoirs were formed would be to withdraw the water at a certain depth, to withdraw a constant amount, to clean out the reservoirs with the surplus of the spring floods, to drain the marshes and low places before inundation, and to provide a sanitary zone around the edge of the impounded area. —S. N. Stroganoff and N. G. Zakharoff.

Résumé of *Report of Communal Service of Moscow, 1927* (Russian). 186 pp. Abstr. W. H. W. Komp.

Many Algae Growths that Annoy the Water Works Man—Fresh water algae are classified into three groups: (1) The red algae group which contains 17 varieties; (2) the green algae division which has 356 species; (3) blue green algae which numbers 232 plants. The odor produced by the various algae may be sweet, grassy, geranium-like, fishy or obnoxious. Algae must have CO₂, nitrogen and sunlight for their growth and development. The nitrogen may be obtained from the nitrates in the water. Copper sulfate is now widely used for the destruction of algae. Chlorine is also used in some places. Copper is probably not a true poison. Doses as high as 15 grains have been prescribed in medicine.

ALGAE	LETHAL DOSE OF	LBS. OF
	COPPER SULFATE	COPPER SULFATE
	P.P.M.	PER M.G.
Synedra	0.20	1.7
Uroglena	0.50	4.2
Asterionella	0.10	0.8

AMOUNTS OF COPPER IN WELL KNOWN FOODS

	Cu present	
	as a metal	CuSO ₄ p.p.m.
Almonds	36.8	145.0
Milk	1.6	6.3
Cucumbers	45.0	177.0
Potatoes	2.8	11.0
Strawberries	8.0	31.4

LETHAL DOSES TO FISH

	CuSO ₄ lbs.	
	CuSO ₄ p.p.m.	per m.g.
Trout	0.14	1.2
Carp	0.33	2.8
Pickereel	0.40	3.5
Goldfish	1.50	4.2
Perch	0.67	5.5
Bass	2.00	16.6

—Anon. *Water Works Eng.*, 80:1256 (Aug. 31), 1927. Abstr. Frank Raab.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M.D., AND LEONARD GREENBURG, PH.D.

Spray Painting in Pennsylvania—

This bulletin of 201 pages including tables, and a short bibliography covers the extensive investigation made by Henry Field Smyth, M.D., and his co-workers under the direction of Richard H. Lansburgh, Secretary of Labor and Industry, Pennsylvania. While the report is dated November 3, 1926, it came off the press late in 1927. Following a 3-page Foreword by Secretary Lansburgh which discusses the organization of the investigation, there follows a detailed description of the 233 plants visited; a report to the advisory committee divided into: Part I, Field Survey, comprising the first 128 pages; Part II, Chemical Engineering Work, to page 192. A special study upon the effect of butyl and amyl acetate vapor on guinea pigs, which arrived at the conclusion that the latter appeared to have no effect upon the pigs while the former is somewhat toxic, comprises a 4-page report.

Careful studies were made of air velocity, benzol, lead content of air, and suspended particles in the air. Urine analyses, blood findings, and a detailed discussion of symptoms of poisoning, are given. Carefully controlled laboratory experiments upon different concentrations of benzol in the air, and upon the accuracy of different methods of determination include the most reliable data which have yet appeared upon this subject. The summary and conclusions follow:

1. The purpose of the study was to determine whether there is a health hazard involved in the coating of surfaces with paint, varnish, lacquer, shellac, enamel, and similar materials by the spray method; and if such hazard is present, in what manner it is manifested and to what extent.

2. In the field survey 233 establishments were visited; 383 physical examinations were made; 168 air velocity measurements were taken; and air was sampled and determinations made for the presence of benzol (91 samples), total solvents (10 samples), lead (22 samples), and dust particles (26 samples).

3. No cases of marked ill health which could be attributed to the work of the individual examined, were found, although some histories to this effect were obtained.

Mild symptoms of benzol absorption were found in persons spraying lacquer, substitute shellac, and stain. Blood examinations showed specific changes, which, while not so far advanced as to produce definite symptoms, were of such character as to indicate the absorption of benzol in its early stages.

Evidences of slight lead absorption were found in some sprayers of lead, but no cases of acute lead poisoning were met.

In the sprayers of vitreous enamel and other siliceous materials, X-ray photographs of the chest showed, in a few instances, definite fibrosis, and in others, lesions suggestive of beginning fibrosis; these two groups comprising not quite one-third of the total number examined.

4. Exhaust ventilation was studied through laboratory determinations. In these, a commercial booth was used for the spraying of objects of dissimilar sizes and shapes with material of different but known benzol content under varying conditions.

5. The health hazards encountered in spray coating processes may be overcome by the use of materials of nontoxic and nonirritating character, by the use of materials in which these elements are reduced to a minimum, and by requiring that when the spraying process is used certain definite precautions must be observed. With this in mind the Department of Labor and Industry has formulated tentative regulations covering this subject which will be discussed at public hearings and which will then form the basis of the regulations adopted and enforced by the department.

6. As the composition of lacquers has not yet been standardized and as almost all lacquer makers are continually changing their formulae and attempting to use entirely new solvents, the effect of which upon the health is or may be unknown, we feel that the indicated pre-

cautions will be advisable even though benzol itself may be entirely eliminated.

—Pennsylvania Dept. of Labor and Industry, *Special Bulletin No. 16*, November 6, 1926.

Final Report of the Committee on Spray Coating—This bulletin of 53 pages includes numerous illustrations, tables, and extensive infolds bearing tables showing, for instance, the findings for lacquer sprayers, undercoat and paint sprayers, vitreous enamel sprayers on sheet metal, and on castings. The National Safety Council created a special committee with A. L. Watson as chairman, which appointed a spray coating committee of 23 members, with Professor C.-E. A. Winslow as chairman, the efforts dating back to October, 1925. On June 4, 1926, Henry Field Smyth, M.D., and his associates, who had just completed the Pennsylvania study (above referred to) was invited to undertake this investigation. The work was done in Detroit and Toledo, except that enameling plants in Mansfield and Cleveland were also visited and studied. The field work was completed in September, 1926. Altogether, 29 different plants (or groups of workers) were studied. Eighty-six air tests were made for benzol, 27 for lead, and 33 for silica. A total of 354 physical examinations were made, including 349 blood tests.

The present report considers the historical development of the problem, spray paint constituents for both interior and exterior work, benzol poisoning, lead poisoning, and silicosis as a spray coating hazard, and the protection of workers by various means, such as the use of masks or respirators and the efficiency of same, medical supervision, the prevention of fire hazard, and the elimination of injurious materials. Approximately 30 pages are given to appendices which discuss in detail the methods used and the clinical findings for benzol, lead, and silica exposed workers (by Henry Field

Smyth, M.D.); and the efficiency of respirators which might be used with the dangerous substances mentioned (by S. H. Katz, E. G. Meiter and F. H. Gibson of the U. S. Bureau of Mines Experiment Station).

The final conclusions read as follows:

We would then urge as our most important and fundamental recommendation that manufacturers of paints, lacquers, shellacs, varnishes and vitreous enamels to be used in spray coating should so far as possible eliminate benzol, lead and free silica from their products and where this has been done should clearly label such products as containing less than a certain maximum amount of lead or benzol or free silica as the case may be; and that employers using the spray gun for indoor and booth work should so far as possible insist on obtaining and using only materials so labeled.

A minority report signed by two members of the committee raises 8 points of dissension and is included upon the last page of the bulletin. These chiefly concern details of the conclusions which the two signers thought were not well founded.—National Safety Council, Chemical Section, Chicago, 1927.

Annual Report of the Ontario Division of Industrial Hygiene—Sickness and accidents are responsible for at least 75 per cent of all absence from work. The employer pays directly for accidents in Ontario, 7 or 8 million dollars per year. He also pays for sickness which costs several times as much. Wage earners in Ontario lose about 30 million dollars a year in wages on account of ill health in addition to all the anxiety and suffering. While occupational diseases are included in this estimate, it is largely made up of the same group of illnesses which affect the general population, e.g., colds, bronchitis, pneumonia, rheumatism and sore throat. About half of the lost time caused by these illnesses can be prevented. This may be done by (1) knowing the material (workers) with which the work is done, (2) periodic supervision of those engaged, and (3) establishing

facilities for promptly dealing with the first indications of a breakdown in an employe. The physician must be brought to the patient.

The division has prepared a booklet, *Occupational Diseases: A Ready Reference Manual*, for distribution. Physicians are using more extensively the division laboratory. Among the chief occupational diseases discussed are those due to lead, which is of chief concern in the storage battery plants, but the general conditions are very favorable in Ontario in this industry since the large manufacturers have made provisions for periodic physical examinations. Lead mining was found to have a few mild cases of lead poisoning. Lead sulphide is the form of ore. Ethyl gasoline is another possible source of lead poisoning which is being watched.

During 1926, 1,040 miners in northern Ontario quarries were given a physical and X-ray examination. In April, 1926, the Workmen's Compensation Act of Ontario was amended to include silicosis, and since that date 97 cases have been compensated. To cope with this condition steps are being taken to examine all men employed under ground at sufficiently frequent intervals to hold the disease in check. So far, the division has received reports of 50 cases and 3 deaths from caisson disease which have been compensated. A study has been made of nickel rash in electro-plating rooms and a quite satisfactory disinfectant has been found, to be used with cutting compounds and cutting oils. In one large iron and steel plant no cases occurred for a period of 6 months after the use of the disinfectant was started. Ventilation studies have been made in paper plants and in cotton and wool plants, also in two schools in Hamilton. As a result of work which has been done in the reduction of infection following injuries, a plant previously notorious for the number of infected injuries, employing 800 men for the year 1926, among

1472 cases of injury, had only 7 infected cases, which caused a loss of 68 days and a cost of \$285.

Cyanogen chloride is being used for fumigation of bunk houses as a safer disinfectant than hydrocyanic acid, since the former has a tear-gas effect which serves as a warning.—J. G. Cunningham, *Annual Report*, Ontario Department of Health, 1926, pp. 18-23.

Resolution On Preventive Medicine Is Endorsed—Dr. L. F. Stewart (Consulting Surgeon, Pennsylvania Casualty Co., Clearfield, Pa.) reported:

Your committee appointed at the morning session of the Health Service Division presents the following for action:

1. That this body believes that it is proper and right that industry, through its medical department, should take all steps possible along the lines of preventive medicine so far as the employe and his family are concerned. Sanitation, examination of the employe, and the general prevention of disease along the lines of health education and the general employe's welfare are not only proper but essential.
2. That it is the opinion of that conference that all accident cases occurring to the employe of a company in the course of his employment should receive proper surgical attention without limit under company supervision in an effort to promptly restore him to his usefulness.
3. That it is the consensus of opinion of this conference that so far as medical attention to the employee is concerned the policy of many corporations wherein they give diagnostic aid in cooperation with the families be endorsed, and that the company lend every assistance to the family physician in returning this employee again to his work.
4. That it is the consensus of opinion

of this conference, except in isolated points, wherein it is impossible for the employee to obtain proper medical and surgical attention, that it is not advisable for the family to receive medical attention either at a stipulated stipend or at the expense of the corporation.—(Signed) S. R. Benedict, W. A. Sawyer, F. E. Clough, L. F. Stewart. *Trans. Natl. Safety Council*, General Sessions, Sixteenth Annual Safety Congress, 1927. p. 249.

Deaths from Lead Poisoning—Lead continues to occupy a position of supreme importance as an industrial poison, and for this reason the present bulletin prepared by Dr. Hoffman in his usual thorough manner is of much interest and value. In this volume Dr. Hoffman has analyzed the available statistics of chronic lead poisoning in the United States, Canada, Great Britain and certain other foreign countries. In addition to this there is presented an analysis of deaths from chronic lead poisoning in the U. S. Registration Area from 1914 to 1924. These death certificates are further classified by occupation and age, and in certain cases statistics concerning contributory causes of death are presented and analyzed. Lastly, in Part 3 of the bulletin, are presented the statistics for chronic lead poisoning from 4 state accident boards, namely Massachusetts, Pennsylvania, California and New York.

It is obviously quite impossible in a brief abstract to present Dr. Hoffman's findings in any detail. The death statistics of the U. S. Registration Area as well as those of the Metropolitan Life Insurance Company show that the death rate has been declining since the year

1912, and now, according to these data, has reached the rate of 1.6 per million persons exposed. The rates for white males and for colored males appear to be very nearly alike.

The largest number of deaths took place in the occupational group of painters, and but 62 occurred in the group of lead workers in smelting plants, etc.

The worker in the field of industrial hygiene cannot fail to be interested in this report and to those interested in the problem of lead poisoning it is of great value.—Frederick L. Hoffman, *Bull. No. 426* U. S. Bureau of Labor Statistics, Washington, Feb., 1927. L. G.

Occupational Diseases in the U. S. Navy—Carbon monoxide, illuminating gas, etc.—There were 6 admissions and 5 deaths. In 1 case, poisoning was reported as complicating another disease or condition. Illuminating gas escaping from a heater was reported as responsible for 2 deaths, gas from a range for 2, and gas from a jet for 1. One patient poisoned by carbon monoxide recovered.

Poisoning by volatile substances, bilge gas, etc.—Admissions were reported as follows: bilge gas, 3; copper and zinc fumes, 1; marihuana plant, 1; trinitrotoluene (TNT) fumes, 2; and turpentine fumes, 1.

Poisoning by lead—There were 37 admissions. Fifteen cases of acute poisoning by lead paint, manner not specified, were reported, and 5 cases were reported in which acute poisoning was attributed to particles or dust from paint. Nine cases of chronic lead poisoning caused by paint were reported—*Annual Report of the Surgeon General, U. S. Navy, 1927*, p. 245.

water, both immediately after inoculation and after the inoculated samples had stood for one half hour. *Bact. typhosum* was used as the test organism. Water sterilized with the 110 volt lamp with an energy consumption of about 300 watts showed no evidence of any residual germicidal activity. When 400 to 600 watts were being consumed, we were able to recover from the irradiated specimens about 40 per cent less bacteria than from the controls. With the 220 volt lamp, consuming about 700 watts, we recovered 28.5 per cent less bacteria from the sterilized than from the untreated specimens. With energy consumption between 800 and 1600 watts this percentage was 42. It is difficult to explain these results on any other basis than that of a residual germicidal action in the irradiated water. The counts were consistently lower with the treated water, although the differences were not constant in different experiments. We were never able to kill all the bacteria added to irradiated water even when the number of organisms used was as low as 100 per c.c. No indication of a residual germicidal action was obtained on samples which were allowed to stand for one hour after sterilization and before inoculation.

When *Staph. aureus* was used in place of *Bact. typhosum* we were unable to find any evidence of residual germicidal action. A few experiments using a strain of the Friedländer bacillus gave results similar to those obtained with the typhoid bacillus.

These results indicate that water after exposure to ultra-violet light of sufficient intensity may show some germicidal activity. We were anxious, however, to make a further study to determine more definitely the factors concerned. While our experimental work is incomplete, we should like to present the results obtained to date.*

Various solutions were exposed in 100 c.c. amounts in 8 inch Petri dishes, to a 220 volt mercury vapor lamp. The actual voltage across the lamp was 150 and the amperage was 3. During exposure the solutions were kept cool by a coil through which cold water was circulating and which served to support the Petri dish. The temperature in the exposed solution never rose above 40°C. The time of exposure was varied but the results obtained after long irradiation (i.e. 30 minutes) were no different from those after 2 or 5 minutes exposure. Immediately after irradiation the solutions and unexposed controls were inoculated with a washed 24 hour broth culture of *Bact. typhosum*, (Rawlings strain). After shaking to obtain as even as possible a distribution of bacteria, a 1 c.c. portion was removed and used to seed a nutrient agar plate. Fifteen minutes later a second portion was removed. Colony counts on the agar plates were made after 24 hours' incubation at 37°C. All

* October, 1927.

solutions were made from sterile distilled water and sterilized in the autoclave before being used.

Experiments were made with the following: distilled water (pH 6.6), NaOH (pH 7.2, 7.8, 8.0), H_2SO_4 (pH 4.2-5.4), $\text{Na}_2\text{HPO}_4 \cdot 12\text{H}_2\text{O}$ (pH 7.8-8.6), 0.1 per cent Na_2SO_4 , 0.1 per cent MgSO_4 , 0.001 per cent phenol, 1 per cent peptone, and 0.35 per cent beef extract. In no instance were we able to detect any evidence of a residual germicidal action.

We next added a culture of *Bact. typhosum* to distilled water, sterilized the suspension in an autoclave and irradiated. No residual germicidal effect was noted. Suspensions of the bacteria were then made in sterile distilled water and in sterile 0.8 per cent saline and immediately irradiated. An exposure of two minutes was sufficient to kill all the bacteria even when a suspension of noticeable turbidity was used. Longer exposures were also used. The irradiated suspensions were then tested for germicidal activity. It is possible to interpret the data from these experiments as indicative of the presence of germicidal activity but the number of experiments so far completed is insufficient to warrant a definite statement at the present time.

Attempts have also been made to detect some germicidal action of irradiated cholesterol but have not yet been successful.

CONCLUSIONS

Water exposed to ultra-violet light may retain a slight germicidal power which can be detected under certain conditions.

This activity was detected with *Bact. typhosum* and with Friedländer's bacillus but not with *Staph. aureus*.

A limited series of salt solutions was irradiated but no residual action was noted.

Phenol, peptone and meat extract also give negative results.

Bacterial cells killed by exposure to ultra-violet light appeared to exhibit a residual germicidal action but our data are too meagre to warrant any definite statements. Further work on this action is being carried on.

REFERENCES

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2. Hess and Windaus. *Proc. Soc. Exper. Biol. & Med.* 34: 171, 1926.
3. Cernovodeanu and Henri. *Compt. rend. Soc. de biol.*, 150: 52, 1910.
4. Walker and Pryer. *A. J. P. H.*, 11:403, 1921.
5. Coblenz, *Sci. Papers, Bureau of Standards, No. 405*, 19:663, 1924.

NOTE—The author acknowledges his indebtedness to Miss Katherine Cox and Miss Mary Vrooman for the experimental results on which this report is based.

EDITORIAL SECTION

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NEW YORK LEADS THE WAY

THE news that Mayor Walker has approved the creation of a Bureau of Nursing in the New York City Health Department, bringing all of the 535 nurses employed in the field and in clinics under one director, is very significant in the administration of public health nursing.

In the book, *Community Health Organization*,¹ which was the culmination of the revised plans for health department administration, the following recommendation is made in relation to bureaus of nursing in big city health departments:

It is considered essential to the highest efficiency that all the nursing work of the department of health should be organized in a separate bureau and under the direction of a chief who is, herself, a nurse. For the administration of such a large organization as is here provided for, a woman of experience and high natural capacity will be needed, and the salary should be commensurate with those paid to other more responsible bureau chiefs.

It is very gratifying that Amelia H. Grant, R.N., who has had a distinguished career in public health nursing and is recognized as one of the foremost public health nurses in America, has been appointed as Director of the newly created Bureau of Nursing. Her appointment is in accordance with the above suggestion and the best public health procedure of the day.

With the increasing trend of public health nursing from unofficial to official agencies, it is exceedingly important that official agencies consider the best possible means of effective public health nursing within their own organizations.

New York has led the way, and it is to be hoped that other communities will consider seriously the recommendations of *Community Health Organization*, so that they too may develop the best possible administration not only in nursing but in all their divisions.

REFERENCE

1. *Community Health Organization*, Edited by Ira V. Hiscock, American Health Congress Series, Vol. II, Part V, American Public Health Association, 1927, p. 42.

THE RETIREMENT OF SIR DAWSON WILLIAMS

THE retirement of Sir Dawson Williams as editor of the *British Medical Journal* is a matter of international importance to the medical world. He has served as editor of this great journal for thirty years, and prior to that, had been connected with the editorial department for seventeen years. In other words, for nearly one-half century, his talents and time have been devoted to the service of the medical profession and the advancement of scientific medicine.

We believe the English appreciate this type of work more than Americans. With few exceptions, the tenure of office in this country is comparatively short and uncertain, though there are few professions which require one to keep so constantly abreast of the times and in closer touch with scientific advancement than the editorship of a scientific journal. Not only must one keep abreast of advances, but he must be on guard constantly against pseudo-science as put forward by the faker on the one hand, or the ill-balanced medical enthusiast on the other.

Sir Dawson Williams was the recipient of many honors from scientific bodies as well as from the Crown, and the British Medical Association awarded him its highest honor—the gold medal of merit.

During his term of service, he has maintained the highest standards of the medical profession and has gained distinction as a journalist. We believe that there is no better medical journal in the world than that to which he has devoted the greater part of his life, and of which he was the guiding genius for so many years. We acknowledge our debt to him.

* Since the above editorial was set, we have been advised of the death of Sir Dawson Williams on February 27.

THE MEASUREMENT OF SCHOOL HEALTH PROGRAMS

THE American Child Health Association is engaged in a research study the aim of which is to find out just how successful the public schools of the country have been in promoting the health of their pupils. In other words, it is a study of the effectiveness of school health programs.* This is a research study rather than a survey. A survey tells what is being done and how it is being done. This research seeks the results from what is being done.

The crux of this study is thus measurement—of what is done in the schools, and of the health of the pupils. To a health problem have been applied the principles of educational measurement. It is from the correlation of these two factors, activity and result, that the association

* See September, November and January issues of *Child Health Bulletin*, American Child Health Association.

hopes to find important clues to effective and ineffective school health activities, allowances of course being made for differing external conditions, such as home environment.

Needless to say, the outcome of this study will be watched with the greatest interest. There is nothing so important as the basing of health work, in school and at large, on clear cut evidence of its value—not merely opinions but indisputable factual evidence. Of course, this is a difficult thing to do. Otherwise we should have far more substantial foundations for many health practices than we now have. Public health practice frequently starts from a laboratory discovery of cause and effect. With this premise there is formed a plan for the social application of this knowledge. It is at this point that so many difficulties are encountered. There is a scientific basis for the use of toxin-antitoxin as a protection against diphtheria. Yet, though lessened, diphtheria continues because humanity cannot be induced to apply this knowledge in a thoroughgoing manner.

Even more difficult than the protection against diphtheria is the successful transmission to the public of a general knowledge of hygiene. Here the matter becomes involved with principles of education, psychology and economics.

Now that we have succeeded in eliminating many of those causes of sickness which were open to attack by collective or community action, such as the prevention of typhoid by water purification, and the prevention of malaria by draining away water which favored the propagation of the malaria bearing mosquitoes, the remaining health problems are largely matters of instructing people in personal habits and conduct. The methods of imparting this instruction are of utmost importance. Our only safeguard against ineffectual methods is through frequent checking or measuring of results.

As we all know, school health work has expanded widely during the last twenty years. It is now almost a universal practice for schools to have physical examinations or inspections, nursing service, health teaching, and physical training. The usual reports of the number of examinations, the number of nursing visits, and the number of teeth cleaned, are of interest in illustrating the volume of effort expended.

The great questions which we should all like to have answered, however, are these:

Is the school child who has received this attention within the school, other influences being equal or equalized, a healthier child as a result of this effort?

What particular health activities bring desired results? Does the member of the tooth brush drill class give evidence of a healthier mouth? Is the recipient of routine school medical inspection and nursing service less encumbered by defects? Does the

recipient of a well formulated health instruction program have a better working knowledge of health?

These are facts about which we know too little, and yet which we ought to take steps to know with more certainty if we are to keep faith with the public which is supporting health work. If the association succeeds in clarifying our knowledge it will have done a most welcome service.

Among the many meritorious features of this research there is one thing that deserves particular mention, and that is that a year and a half was spent in preparation before the actual gathering of data in the field. Tests were constructed, tried out and standardized before acceptance. This practice of thorough and considered preparation before launching an extended investigation could well be emulated.

THE CAUSE OF YELLOW FEVER

ANOTHER chapter concerning yellow fever has been written, and the etiology of the disease has at last been cleared of some of its accumulated rubbish. The work of Carlos Finlay and of the Commission under Walter Reed, concerning the agency of the *Aedes aegypti* as the carrier, has been abundantly confirmed, and it seems equally certain that the germ of the disease belongs to the class of filterable viruses, which will pass through the V and N grades of Berkefeld filters.

This work has been done under the auspices of the International Health Division of the Rockefeller Foundation on the Gold Coast of West Africa. The title of the preliminary paper¹ does not give a fair idea of the importance of the contribution. The finding of an animal, the *Macacus rhesus*, which is susceptible to yellow fever, is necessarily a great step forward in the study of the disease, though other facts of equal or greater value, in our opinion, have been proved.

The virus has been carried from monkey to monkey by inoculations of blood or serum 30 times, and by infected mosquitoes 22 times. Mosquitoes fed on infected monkeys on the second or third day of fever invariably acquire the power to transmit the disease. Certain experiments showed that the mosquito remains infective as long as 91 days. Generally the mosquitoes are kept alive easily for the 3 months and are infective as long as they live. It is impractical to carry the virus in monkeys, since it disappears rapidly from the circulating blood, an observation which agrees entirely with that on human beings by the Reed Commission. Many cultures have been made from the blood of infected monkeys in the special media devised for the cultivation of leptospiras, all negative, and so far none have been found in the tissues

of monkeys dead of the disease. We may therefore dismiss the alleged discovery of Noguchi.

It will be remembered that the well-known expert on yellow fever, John Guit  ras, never accepted this work, giving two grounds which he considered sufficient for its rejection. The first was that yellow fever did not occur in epidemic form in animals in the tropics, although inoculation with the leptospira was easy, and second that the leptospira was found after the third day, an observation entirely at variance with the proof given by Reed and his associates that the blood of yellow fever patients contained the virus only during the first three days.

The diagnosis of yellow fever, even in its mild forms, seems to be easy by the inoculation of the *Macacus rhesus*, but of almost greater importance is the fact that 0.1 c. c. of the serum from a convalescent patient protected monkeys against fatal doses of virulent blood as well as against the bite of infected mosquitoes.

Once again intensive investigation has revealed the secrets of one of the most puzzling of all diseases, but another life has been given to this discovery. Dr. Adrian Stokes, head of the Commission, fell a victim to yellow fever, contracted apparently from an infective monkey. One other name must be added to the roll of those heroes who have sacrificed their lives for the good of their fellowmen in the course of medical progress.

REFERENCE

1. *J. A. M. A.*, Jan. 28, 1928.

ASSOCIATION NEWS

CHICAGO MEETING

THE President has appointed Dr. Louis E. Schmidt, Chairman of the Local Committee for the Fifty-Seventh Annual Meeting of the A. P. H. A. Arthur E. Gorman is Secretary of the committee, which is being rapidly completed. Headquarters of the committee have been established in Room 409 of the Hotel Stevens. This office also serves as headquarters for Dr. C. St. Clair Drake, Director of Exhibits. Members of the Association are invited to make full use of the facilities of this office when they are in Chicago.

The Central Program Committee has outlined a program for the Annual Meeting covering 30 sessions of the sections, 7 of them joint sessions. Three special sessions, 2 general sessions, and a banquet are planned in addition. The committee decided to hold the opening General Session on Monday evening, October 15, and begin the section meetings on Tuesday morning. The American Child Health Association, the American Social Hygiene Association and other organizations and committees will hold meetings on Monday. A full program of trips and entertainment is being developed by the Local Committee which is determined to make the Chicago meeting the best the Association has ever held. All meetings will be held in the Hotel Stevens which will be headquarters. Because of the increased attendance which is expected, the Technical Exhibit will be larger than formerly and will include a wider range of interesting displays. A similar extension of the scientific exhibit is planned.

Members who contemplate offering papers at this meeting are urged to communicate without delay with their re-

spective section chairmen, as the programs are rapidly being completed.

RURAL HEALTH EDUCATION

AT the request of the Milbank Memorial Fund the Association has agreed to undertake a share of the direction and organization of a program of health education in connection with the Chautauqua program in about 200 communities in the northeastern United States. A committee has been authorized by the Executive Board to represent the Association in this project, and Dr. S. J. Crumbine has been appointed chairman of this committee. Under its direction data on public health will be assembled for the use of the Chautauqua lecturers who will speak on the importance of personal hygiene and the value of giving generous support to official public health work. The health officers of the states concerned have been invited to meet with the committee to suggest points of emphasis that will be helpful to them in developing the program in their respective states. To assist in this work the Association has secured the temporary services of Dr. Edward T. Devine who will work under the direction of the committee.

WHAT IS PUBLIC HEALTH WORK?

THE first task of the committee authorized to conduct a census of public health workers was to decide on a definition of public health work. It has tentatively adopted the following definition with a series of sub-definitions for public health workers of various types: "For the purpose of this census public health work shall be defined as those activities carried on by an individual himself, or in connection with an organ-

ization, supported either by public or private funds; this work to be directed primarily towards the prevention and control of disease, the promotion of hygiene and the prolongation of life rather than the cure of the already sick individual."

WEST COAST

AN organizing committee for the west has been appointed under the chairmanship of Dr. W. C. Hassler, Health Officer of San Francisco. This committee is considering the possibility of holding a regional meeting of the Association in Portland early in June.

1929 MEETING

IN accordance with the policy adopted last year communications have been sent to health officers and chambers of commerce in all the larger cities in the two districts from which the 1929 An-

nual Meeting city is to be selected. These are the Southeastern and Midwestern Districts.

POCKET CARDS

AT the request of a number of members pocket membership cards have been prepared and will shortly be sent to all members and Fellows in good standing.

WF. Walker, D.P.H., field director of the Committee on Administrative Practice will attend the conference on Records and Reports, Asheville, N. C., April 19-21 called by the Child Health Demonstration Committee.

Elizabeth Brezee, formerly statistician for Child Health Demonstration, Fargo, N. D., will be temporarily associated with the Committee on Administrative Practice, in developing a hospital survey schedule.

NEW MEMBERS

- Robert Eaton Andrews, M.D., Chicopee Falls, Mass. (Assoc.)
- J. W. Becker, St. Louis, Mo., Executive Secretary, Missouri Tuberculosis Association
- Howard H. Bell, M.D., St. Louis, Mo., Tuberculosis Controller
- L. C. Billings, Grand Rapids, Mich., Superintendent and Chief Chemist, Filtration Plant
- Grover C. Bolin, M.D., Orangeburg, S.C., County Health Officer
- R. E. Bower, M.D., Chillicothe, O., County Health Commissioner
- Bertrand Brown, New York, N. Y., Assistant Secretary, Milbank Memorial Fund
- Flora N. Brown, R.N., Ann Arbor, Mich., Executive Secretary, Washtenaw County Branch, Michigan Tuberculosis Association
- Rex Dean Bushong, D.V.M., Raleigh, N. C., Assistant Engineer, Milk Sanitation State Board of Health
- Laurence B. Chenoweth, M.D., A.B., Cincinnati, O., Professor of Hygiene, University of Cincinnati
- Carrol J. Clements, R.N., Pelzer, S. C., Public Health Nurse in Pelzer Mill Village
- John E. Coe, A.B., M.S., Chicago, Ill., Acting Dean, Chicago Medical School
- Alonzo Cooper, Cape Breton, N.S., In charge Laboratory Department, New Waterford General Hospital
- Andrew J. Crowell, M.D., Charlotte, N.C., President, North Carolina State Board of Health
- William R. Davis, A.B., D.D.S., Lansing, Mich., Director, Bureau of Mouth Hygiene, State Department of Health
- Francis De Caria, M.D., Bradford, Pa., Tuberculosis Clinic.
- F. W. W. Des Barres, B.A., D.D., Sackville, N. B., Librarian, Mount Allison University (Assoc.)
- Robert K. Galloway, M.D., Bardwell, Ky., Director, Carlisle Co. Health Department
- Jane & Gilliford, M.D., Pomeroy, O., County Health Commissioner
- Benjamin Goldberg, M.D., Chicago, Ill., Member and Secretary, Board of Directors Municipal Tuberculosis Sanitarium
- Ivan C. Hall, Ph.D., Denver, Colo., Professor and Head of Department of Bacteriology and Public Health, University of Colorado
- Thomas W. Henderson, Washington, Pa., Secretary, Milk Control Officer, Board of Health

- Reuben G. Hamilton, M.D., Columbia, S.C.,
Malariaologist, State Board of Health
- Montfort Haslam, M.D., Concord, N. H.,
Health Director, St. Paul's School
- Lee Swee Hock, M.S.D.S., Kuching, Sarawak.
Borneo, Health Inspector (Assoc.)
- Charles P. Hoover, Columbus, O., Superin-
tendent of City Water Filtration Plant
- Emma A. Hunt, M.A., Framingham, Mass.,
Teacher of Physiology and Hygiene, State
Normal School.
- O'Neill Kane, M.D., Kane, Pa., Health Officer,
B & O Lines
- Ethel Kersey, R.N., Elizabethtown, Pa., with
State Department of Public Health
- Harold B. Keyes, M.D., New York, N. Y.
(Assoc.)
- Edmond Klamke, M.D., Alexandria, La., Di-
rector, Rapides Health Unit
- Howard W. Koch, B.S., M.S., Pittsburgh, Pa.,
Bacteriologist, Fisher Scientific Co.
- S. A. Lamoureux, M.D., New Bedford, Mass.,
Member of Board of Health
- Carl W. Larson, Chicago, Ill., Director, Na-
tional Dairy Council
- Lila B. Love, M.S., Greensboro, N.C., Teacher
of Bacteriology, North Carolina College for
Women
- Gordon L. McLellan, M.D., San Leandro,
Calif., President Board of Health
- Clara S. Miller, R.N., Taylorville, Ill. County
Tuberculosis Nurse
- David Moxon, B.Sc., C.P.H., Indianapolis, Ind.,
with Indiana Tuberculosis Association
- Wilford A. Norris, M.D., Columbia, Mo., City
Health Commissioner
- Henry D. Peters, B.S. in C.E., Jefferson City,
Mo., Assistant Engineer, State Board of
Health
- Mary E. Pillsbury, B.S., M.A., New York, N.
Y., Consultant, Prophylactic Nursing Technic
- Gertrude M. A. Priebe, Detroit, Mich., Special
Education Open Window Room Department
- Edward M. Quinby, D.M.D., Boston, Mass.,
Lecturer, Dental Hygienist School, Forsyth
Dental Infirmary
- T. Eben Reeks, M.D., New Britain, Conn.,
Hospital Superintendent
- Jean K. Rich, M.S., Chicago, Ill., Director,
Nutritional Education, American Institute of
Baking
- Rozella L. Robinson, Glendale, Calif., Junior
Technician, Los Angeles County Health
Department
- Lillian Simpson, R.N., Los Angeles, Calif.,
Chief Nurse, Los Angeles County Health
Department
- C. N. Sisk, M.D., Raleigh, N. C., Director,
Department County Health Work
- Ada S. Stokes, Cincinnati, O., Director of
Nurses, Babies' Milk Fund Association, Cin-
cinnati General Hospital
- Caroline A. Supe, A.B., Ypsilanti, Mich.,
School Nurse, State Normal College
- M. W. Tatlock, Dayton, O., Superintendent
Sewage Treatment Works
- Alice H. Walker, Detroit, Mich., Director
Social Service and Clinic Administration,
Harper Hospital
- J. W. Weber, M.D., Woodsfield, O., County
Health Commissioner
- Kathryn Weigel, Los Angeles, Calif., Techni-
cian, Los Angeles County Health Depart-
ment
- Marion McN. Wetzel, R.N., Ann Arbor, Mich.,
Washtenaw County School Nurse
- Verna Willis, B.S., M.S., Jefferson City, Mo.,
Assistant Bacteriologist, State Health Lab-
oratory

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

Typhoid Fever Carriers—There are now 155 known typhoid fever carriers in upstate New York exclusive of the 33 who live in state institutions. During the year 1927, 25 newly discovered typhoid fever carriers were added to the list by the New York State Health Department, giving the total mentioned above. These new carriers were responsible for 47 known cases of typhoid fever. Eight of the carriers are male and 17 female, their ages ranging from 21 to 66. One carrier had typhoid fever as long ago as 1871 and 4 of them stated that they had never had typhoid fever. Eleven carriers were removed from the active list during the year. Of these, 4 died, 3 were apparently cured by gall bladder operations, 3 moved outside of New York State, and in 1 the diagnosis was changed.—*Health News*, New York State Department of Health, V, 30, Feb. 20, 1928.

Diphtheria Control in Kansas—

A review of the incidence of diphtheria in Kansas shows no downward tendency has been observed until the year 1922. Kinniman gives 6 reasons for this change: (1) The establishment of full-time county health units in the state; (2) culturing of schools and removal of carriers where epidemics occur; (3) medical inspection of school children and correction of remedial defects of the nose and throat; (4) change in the quarantine laws on cases and carriers; (5) education of the public in preventive measures; (6) immunization of children with toxin-antitoxin.

Educational campaigns with respect to the value of using toxin-antitoxin have been extensively carried on with

the coöperation of newspapers, insurance companies, and 22 county medical societies. This work is resulting in a lower death rate for 1927 than that for 1926. C. H. Kinniman, Diphtheria Control in Kansas, *Kansas Medical Society J.*, 27:325 (Oct.), 1927.

Diagnosis of Measles—Stimson makes a plea for the individual isolation of every person with measles. He feels that secondary infections at times are almost as contagious as is the primary measles. The features of the period of onset are enumerated chronologically by associating them with the fingers of the outspread hand.

Beginning with the little finger is the first symptom, fever. Twelve hours later comes the ring finger, or puffiness of the lower eyelid, and perhaps the measles line, together with the first sign of the enanthem or rash on the fauces. Twelve hours later or middle finger, come the evidences of catarrh, also known as the three C's; to wit, conjunctivitis, coryza and cough. Twelve hours later, or the forefinger, are found Koplik's spots. Thirty-six hours later, or as far from the forefinger to the thumb as it is from the little finger to the forefinger, comes the rash or exanthem, and for the palm we have a certain amount of headache and a considerable malaise throughout this period.

Stimson describes the so-called measles line, "a fairly definite line of congestion across each lower lid, about at the margin of the tarsal cartilage and perhaps a third of the way from the lid margin to the fornix." The appearance of this line has assisted in making an early diagnosis.—Philip Moen Stimson, *The Earlier Diagnosis of Measles*, *J. A. M. A.*, 90:660 (Mar. 3), 1928.

Cattaraugus County Demonstration—The County Board of Super-

visors has voted to finance the activities of the County Board of Health for the year 1928 as developed with the aid of the local demonstration being conducted by the Milbank Memorial Fund. During the 5-year period of the demonstration the tuberculosis death rate has been reduced about one-third, while there has been a reduction of nearly one-fifth in the infant mortality rate. Cataugaus can boast of having established the first county health department and the first county-wide school health unit in New York State. While there have been some objections made to the demonstration program by members of the medical society, it must be said that, on the whole, the physicians have given splendid coöperation in the development of the County Health Department, and have assisted in building up preventive programs in the field of tuberculosis, maternal hygiene, and child welfare.—Edward W. Sheldon, *Milbank Memorial Fund Quarterly Bulletin*, Jan., 1928.

Isolation of Communicable Diseases—The New York City Department of Health has recently distributed new rules for isolation and exclusion of school children in cases of communicable diseases. The small publication in which these regulations appear summarizes a few of the principal signs and symptoms for each communicable disease. There is also an abbreviated statement of the chief source of infection and the mode of transmission. The usual incubation period is stated, and definite rules are enumerated with respect to the duration of exclusion from school for both patient and exposures. The exposures are again subdivided into those having had the disease and those who have not had the disease.

In the case of diphtheria the patient is excluded from school until two successive negative cultures taken not less than 24 hours apart have been obtained from the site of the disease or prefer-

ably from the nose and throat, the first of these terminating cultures to be submitted not less than 12 days after the onset of the disease. Exposed persons may return to school 7 days after the last contact with the patient, provided they show a negative culture at the end of the 7-day period. Those who change their addresses must move to a home where there are no children. All exposed persons are urged to receive temporary protection by an injection of antitoxin. Later they should procure permanent protection by immunization with toxin-antitoxin.

In the case of scarlet fever the patient is excluded for a minimum period of 30 days from onset, provided no abnormal discharges are present at the end of that period. Those exposures who have had the disease may return to school provided they move to a home where there are no children, but those exposures who have not had the disease may return to school 7 days after last exposure.

In the case of measles the patient is excluded from school for 7 days after the appearance of the rash, provided no abnormal mucous membrane discharge is present. Those exposures who have had the disease are not excluded if there is sufficient evidence that they have actually had measles, and if they move to a new address where there are no children. Those who have not had measles may return to school 14 days after the last exposure.

Other diseases for which rules have been outlined are typhoid fever, smallpox, poliomyelitis, epidemic cerebrospinal meningitis, whooping cough, german measles, mumps, chicken pox, and tuberculosis.—Louis I. Harris, Commissioner, New York City Department of Health.

Trachoma Prevention Program—The first organized trachoma prevention work of the U. S. Public Health Service was undertaken in Kentucky in 1912.

In 1913 and 1914 this work was extended to 23 counties in that state, involving an examination of over 18,000 people. A plan was evolved for the establishment of small hospitals to serve as dispensaries and clinic centers, and headquarters for surveys and educational work. The first hospitals were established in Kentucky in 1913. The survey work has been extended to West Virginia, Tennessee, Arkansas and Missouri. In the latter state it was found that 20 per cent of blind pensioners who were receiving on the average of \$300 each per year from the state were blind as a result of trachoma.

The trachoma prevention program has served as an impetus to the installation of full-time county health departments. The trachoma hospitals have a fourfold function:

1. Clinical treatment of cases
2. Study of the disease itself
3. Education of patients in personal hygiene and disease prevention
4. Centers for field work.

Paul D. Mossman, Trachoma In The State's Health Program, *Pub. Health Rep.*, 43:449 (Feb. 24), 1928.

Codification of Ordinances—Greenman aims to suggest a practical manual of procedure for the codification of ordinances. The author points out the need of a systematic code as a convenience to the courts, the legislature, and the city officials. The material codified should be kept up to date and should consist only of those ordinances and regulations which are being enforced, and those which are either obsolete or which have been nullified by changed

conditions should be eliminated. He outlines the administrative code now employed in several cities including Cincinnati, Kansas City, Cleveland, and Toledo, and then proceeds to the establishment of first, a summary outline for a model municipal code, and follows this with a more detailed outline. With regard to the sanitary code the author states:

Sanitary codes applicable to various sections of the country are more difficult to standardize. They must be developed in conformity with state-wide conditions. Model sanitary codes have been prepared for some states, notably New York and Iowa. The American Public Health Association has a model sanitary code in preparation at the present time. The U. S. Public Health Service has issued bulletins giving municipal ordinance rules and regulations pertaining to public health. These bulletins will often give sanitary regulations on special subjects and are of considerable value where unusual conditions are being regulated.

The model sanitary code contains 7 articles, each one of which has from 2 to 37 subdivisions. The articles are as follows:

1. Communicable diseases
2. Milk and cream
3. Meat and meat products
4. Sanitation
5. Camps
6. Miscellaneous
7. Penalties and general provisions.

The captions of the subdivisions serve to remind one working on a proposed sanitary code of the practices and procedures which should be considered in formulating such code.—E. D. Greenman, Codification of Ordinances, *Publication No. 6*, Municipal Administration Service, 261 Broadway, New York, N. Y., 1928.

LABORATORY

C. C. YOUNG

A SIMPLIFIED PROCEDURE IN DETERMINING B. COLI IN WATER

(PRESUMPTIVE TEST)

WILLIAM LITTERER, PH.C., M.D.

*Director of Laboratories, Tennessee State Department of Public Health,
Nashville, Tenn.*

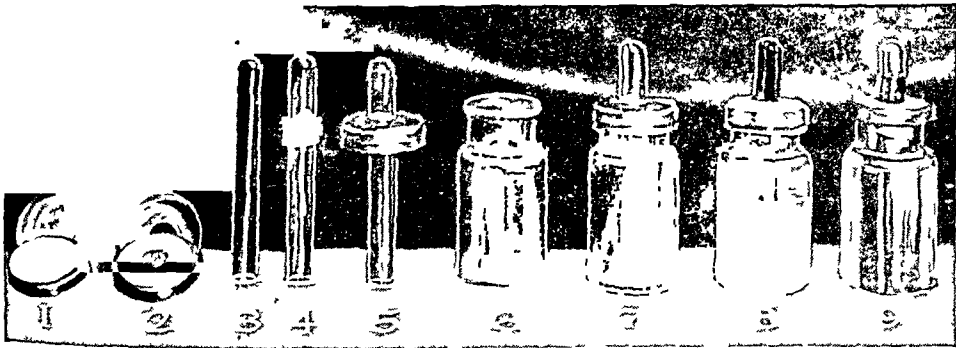
SIMPLIFICATION of any procedure in determining *B. Coli* in water is manifestly welcomed by bacteriologists provided it does not jeopardize accuracy in attaining results.

This procedure is not only simple but quite inexpensive as compared with the Smith fermentation tube or the Durham inverted tube method in determining the production of gas in the lactose broth medium.

This method has been used by the Tennessee State Department of Public Health Laboratories for a number of years with a few modifications each year

until at the present time the following procedure is being carried out.

Instead of using the Smith fermentation tube or the Durham tube we simply employ an ordinary specimen bottle, capacity 50 c.c.; outside diameter at the base 4.3 cm.; outside diameter at the mouth with lip 4 cm.; height 8 cm. Into this specimen bottle a test tube is inverted, capacity 10 c.c., length 10 cm.; outside diameter 1 cm. A tin salve box (lacquered) which is ordinarily used in mailing samples of feces, is used for a covering or top to fit over the mouth of the bottle (either the top or bottom



Five samples of water can be tested in this compact space

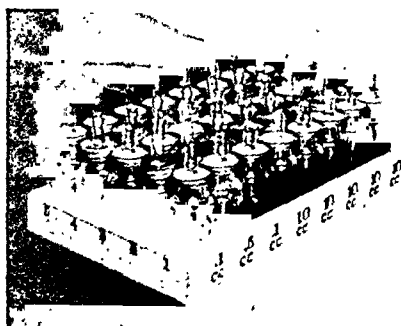
- | | |
|---|---|
| 1 Lacquered tin box opened | 6 Fermentation bottle |
| 2 Holes cut into center of top and bottom of box | 7 Test tube with attached tin top placed into bottle |
| 3 Test tube | 8 Fermentation bottle with test tube filled with lactose bouillon |
| 4 Test tube with cotton string | 9 Fermentation bottle and tube indicating fermentation |
| 5 Test tube pushed into hole of tin top with cotton string on under surface | |

of the box can be used). This tin box should have an inside diameter slightly greater than the outside diameter of the mouth of the bottle so as to fit loosely over its mouth. The tin top should have a hole cut into its center so that the test tube will fit snugly when pushed into it. The diameter of the hole should be about the same as the outside diameter of the test tube. It is necessary to make the joint fit securely to prevent outside contamination. This is accomplished by wrapping a cotton string (wet) 2 or 3 times around the test tube at a point on a level with the mouth of the bottle. Then the tin box is pushed down over this which acts as a washer. It will fit securely especially after sterilization which causes the cotton string to contract thereby making a perfect joint. The cotton string serves to hold securely the tin top to the test tube and at the same time to prevent outside contamination. Quite recently we have used an improvised method of fixing the top to the test tube; viz: by soldering a small galvanized iron ring, 1 cm. on the under surface of the tin box. The ring should have sufficient diameter to allow the cotton string to act as a bushing. This soldered ring on the under surface of the tin box serves to fit the test tube in a definite position and affords a better bushing with the cotton string. However, the other method is practically as satisfactory. The tin top overhangs the mouth of the bottle about 1 cm. which also prevents dust particles and bacteria from gaining entrance to the bottle.

This simple apparatus, above described, is now ready for use. About 30 c.c. to 35 c.c. of lactose broth is introduced and sterilized on 3 successive days or by autoclave 15 lbs. not to exceed 20 minutes. Such sterilization will dispel all of the air in the inverted test tube leaving no bubbles in the upper part. Such an apparatus, which we may term as a "fermentation bottle," is quite inexpensive only costing about 5 cents. It is

easy to clean and to refill, not apt to break—will set on its own base and there is no cotton to contend with.

Another great advantage is the rapidity with which water can be inoculated in this "fermentation bottle." For



Tray holding forty sterile "fermentation bottles" filled with lactose broth ready to be tested.

example, if 10 c.c. of a given water is desired to be inoculated into a "fermentation bottle," just simply raise or tilt, with the left hand, the test tube attached to the tin box and with the right hand introduce the 10 c.c. of water by means of a 10 c.c. pipette. Many samples can in this way be inoculated in a very short space of time.

SPECIAL TRAY

Another advantage is the great saving of incubator space especially where a large number of samples of water is to be examined, viz: by the use of a "special tray" which we have devised for the purpose. This tray is designed to fit the average regulation incubator. It is sufficiently large to hold 10 samples of water. These trays can be placed upon each other so that 20 or even 30 samples of water can be tested for fermentation in any regulation small incubator.

The tray can be made by a carpenter at a very small cost. The following are the dimensions of a tray that will hold enough "fermentation bottles" to analyze at one time 10 samples of water. We

use 8 "fermentation bottles" as a routine for each sample of water for example:

5 bottles containing 10 c.c. of the water			
1 " " 1 c.c. " " "			
1 " " 1/2 c.c. " " "			
1 " " 1/10 c.c. " " "			

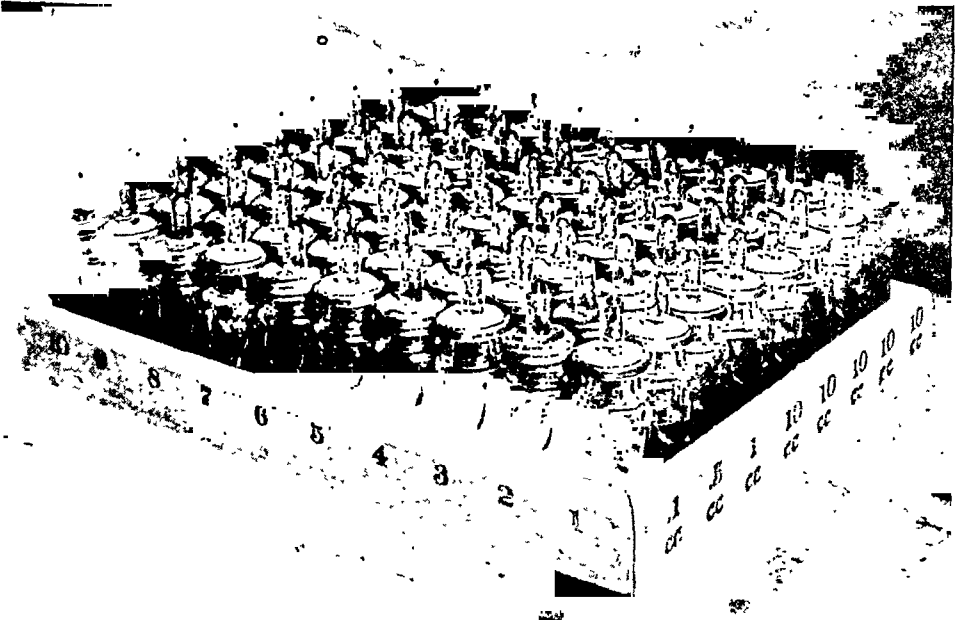
Therefore for 10 samples of water there will be 80 "fermentation bottles."

The tray is made of poplar wood about 2 cm. thick. It is 43 cm. long, inside dimension, and 34 cm. wide, inside dimension. The border or flange of the tray should be raised about 2.5 cm.

On the outside of the tray are the following numbers printed on the flange of the long portion 43 cm., viz: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10; This indicates the number of samples of water to be tested. Now on the wide or short side of the tray, i.e. 34 cm. is printed 0.1 c.c. —0.5 c.c. —0.1 c.c. —10 c.c. —10 c.c. —10 c.c. —10 c.c. —10 c.c. This indicates the amount of water inoculated into the "fermentation bottles." If you prefer to change the figures as to the quantity of water introduced into the "fermentation

bottles" you may do so according to your preference. We simply use this amount as our routine examination of all samples of water where we have a reasonable check on said waters. However, on totally unknown waters we employ a greater dilution in addition to the above scheme outlined.

The tray containing 80 bottles (10 samples of water) can now be easily handled and placed into any regulation incubator. At the end of 24 hours it can be removed and fermentation noted. If any of the tubes show fermentation then a sterile platinum loop is thrust into the "fermentation bottle" by simply lifting and tilting the test tube and attached tin top. No cotton to worry with or flaming the mouth is necessary. No removal or handling of the "fermentation bottle" from its original position. It is not necessary to remove the bottle from the tray. The tray is now placed back into the incubator for another 24 hours and at the expiration of 48 hours a final reading of the various fermenting tubes is re-



Tray holding eighty sterile "fermentation bottles" filled with lactose broth ready to be tested. Ten samples of water can be tested in this compact space.

corded or subsequently inoculated on Endo media, etc., etc., for final determination of *B. Coli*. The suspicious colonies isolated on Endo or litmus lactose agar or E. M. B. media can now be inoculated into a sterile "fermentation bottle" containing lactose broth or other sugars if necessary.

If a tray is wanted to hold enough for the examination of 5 samples of water or in other words to hold 40 "fermentation bottles," the following inside dimensions are recommended, viz: 34 cm. long, and 22 cm. wide, with a flange about 2.5 cm. from inside.

WATER ANALYSIS IN THE FIELD

The use of the "special tray" for 5 samples of water holding 40 sterile "fermentation bottles" filled with lactose

broth renders possible the inoculation of water samples in the field. An ordinary hand valise will hold 2 of these trays, i.e. enough material for the examination of 10 samples of water. Owing to its compactness there is no danger of spilling the media unless the valise be actually up-ended. The sterile pipettes can also be placed in the valise hence making the outfit complete. The inoculated samples can now be taken to the nearest incubator for future observation.

CONCLUSION

The foregoing outlined procedure is practical and accurate, at the same time inexpensive and time saving. It should appeal to all laboratories especially to state laboratories where a large number of samples of water is daily examined.

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

A New Health Record in American and Canadian Industrial Populations—In no previous year were health conditions among the industrial populations of the United States and Canada as satisfactory as during 1927.

The death rate among the wage-earners of the two countries, and their dependents, may be accurately gauged by that of the more than 18 million of them who are industrial policyholders of the Metropolitan Life Insurance Company. This rate dropped, in 1927, to the amazingly low figure of 8.4 per 1,000, which is a new minimum for all time. The year 1926 is the latest for which comparable mortality data for the general population are available. From 1911 to 1926 the general population death rate for persons in the age range which is comparable with that of the Metro-

politan industrial experience (that is 1 to 74 years, inclusive) declined only 11.7 per cent. But among the insured wage-earners, their wives and children, during the same period of years, the death rate dropped 29.3 per cent. The reduction in the death rate has been reflected in a considerable increase in the expectation of life. Among wage-workers and their families the expectation of life in 1926 was 8.39 years longer than the average for the years 1911 and 1912. In the general population the increase was only 4.70 years.

There were very few untoward developments in the public health record of the year. There were, it is true, some unfavorable items, and these are of considerable importance because they pertain to preventable diseases. Early in the year there was a bad outbreak of

typhoid fever in Montreal; and there was unusual prevalence of poliomyelitis in the United States which resulted in an above-average death rate for this disease. The year was also marked by an increase in the prevalence of diphtheria, which was not only quite general over the United States but in various other parts of the world. What has happened with reference to these three diseases has had little effect upon the general death rate because, after all, they are of relatively small importance numerically. More important is the increase in violent deaths.

Beyond question the greatest single public health fact of 1927 was the great reduction in mortality from tuberculosis to a new minimum for all time. The death rate from tuberculosis of the respiratory system which causes almost nine-tenths of all the deaths from tuberculous disease, has dropped 59.3 per cent since 1911. While the mortality from diphtheria increased slightly last year there was marked improvement with respect to measles, scarlet fever, and whooping cough. No other single item contributed so much to the establishment of a new minimal death rate last year as did the unprecedentedly low mortality from pneumonia. And never before except in 1919 and 1921 (the years following the great influenza pandemics) has there been as big a year-to-year drop in the pneumonia death rate as was recorded between 1926 and 1927. A drop in the mortality from influenza was an important factor in establishing the new minimum for pneumonia. The facts for cancer in 1927 give no comfort. Although the death rate is only fractionally higher than that for last year it again stands as a new maximum figure for this disease. The diabetes death rate in the industrial population in 1927 was the same as in 1926. The death rates for heart conditions and cerebral hemorrhage dropped slightly last year and that for chronic nephritis declined appreci-

ably. The death rate for puerperal diseases, in 1927, although identical with that recorded in 1926, is the lowest ever registered among women in the American and Canadian industrial populations. The 1927 alcoholism rate was higher than that for any year since 1917 with the exception of 1926. It is lower than for any year between 1911 and 1917 inclusive. There was a slight decline in the death rate, from cirrhosis of the liver, that is, from 6.7 in 1926 to 6.6 in 1927. There is one single item in the fatal accident situation where conditions are going from bad to worse each year. This item is automobile fatalities. The 1927 figure is more than eight times that for 1911, more than three times that for 1915, almost twice that for 1917 and has increased 67.6 per cent in the 7 years since 1920. The 1927 suicide rate was the highest in the industrial population since 1917. The homicide rate showed a slight increase over last year.—*Met. Life Ins. Co. Stat. Bull.*, 9:1-9 (Jan.), 1928.

Vital Statistics of Philadelphia, 1927—The death rate in Philadelphia was 12.2 per 1,000 population, the lowest in the history of the city. The only other year which approached that of last year was 1921, when the general mortality was 12.7. The greatest reductions are in the acute and chronic infectious diseases. A conspicuous feature is the tremendous drop in the mortality from pneumonia and broncho-pneumonia. Last year the total number of deaths from these two causes was 2,361 and a mortality rate of 116.0 per 100,000 population, compared with 3,441 and a mortality rate of 171.4 for the year 1926. The tuberculosis death rate for the year 1927 (85.5 per 100,000 population), as well as the infant mortality (63.8 per 1,000 births), were the lowest in the history of the city.

The common acute infectious diseases showed the lowest mortality on record;

typhoid fever with a death rate of 1.4 per 100,000 population; measles with only 3 deaths and a rate of 0.2; scarlet fever, in spite of its prevalence, registered only 34 deaths and a rate of 1.7; whooping cough with 31 deaths and a rate of 1.5; diphtheria with 220 deaths and a rate of 10.8, which was the lowest on record. There were 1,175 fewer deaths from heart disease last year than in 1926.—Philadelphia Dept. of Public Health. *Monthly Bull.* 13:2, (Jan. & Feb.), 1928.

Vital Statistics of Kenya, British East Africa—The compilation of vital statistics in Kenya is made difficult by the lack of definite information as to the number of natives living in the section and by poor registration of births and deaths.

In Nairobi a census in 1926 showed 2,665 Europeans and 9,199 Indians, Arabs and others while the Africans were estimated at 21,000 making a total of 32,864. The total deaths in 1926 were 745 giving a crude death rate of 22.6 per 1,000 as compared with 12.8 for 1925. The European death rate was 13.5 per 1,000 Europeans, the Asiatics had a rate of 30.3 and the natives 17.3. The chief cause of death was pneumonia which caused 171 deaths in 1926, and 121 in 1925, malaria caused 130 deaths in 1926 and 19 in 1925, plague 32 in 1926 and 4 in 1925, tuberculosis 17 in 1926 and 14 in 1925, dysentery 9 and typhoid fever 4 in 1926.

The population of Mombasa was 40,500 including 676 Europeans. There were 776 deaths in 1926 giving a death rate of 19.5 for the total population and of 13.3 for the Europeans. Pneumonia caused 150 deaths in 1926 and 105 in 1925, pulmonary tuberculosis 69 deaths in 1926 and 67 in 1925, malaria 84 in 1926 and .93 in 1925, diarrhea and dysentery 45 in 1926 and 87 in 1925.

The population of Kisumu in 1926 was 7,656 including 141 Europeans. In

the same year there were 191 deaths giving a death rate of 24.9 as compared with 17.9 in 1925 and 1924. The European death rate in 1926 was 21.3. The death rate from respiratory diseases was 850 per 100,000 in both 1925 and 1926, from tuberculosis 50 in 1925 and 90 in 1926, from malaria and blackwater fever 100 in 1925 and 380 in 1926, and from intestinal diseases 200 in 1925 and 340 in 1926.—*Annual Medical Report of the Colony and Protectorate of Kenya*. 1926. p. 9-18.

Health Conditions in Tanganyika—From a report to the League of Nations on the administration of Tanganyika territory for the year 1926, it appears that the European population is now about 4200. The total native population is now estimated as 4,319,000.

The number of European medical officers employed increased from 39 in 1925 to 46 at the end of 1926, the number of Asiatic assistant, senior sub-assistant, and sub-assistant surgeons from 39 to 50, and the number of private doctors registered as medical practitioners in the territory from 8 to 14. These figures do not include the headquarter staff, laboratory staff, entomologist, and dental surgeons.

The incidence of dangerous infectious diseases throughout the territory during 1926 was very low. A total of 20 cases of smallpox was reported from five districts; no deaths occurred. Cerebrospinal fever showed no signs of becoming epidemic; only light cases, with 4 deaths, occurred.

With the exception of 6 fatal cases reported from the remote district of Shirati, an epidemic area situated on the Tanganyika-Kenya border, no cases of plague were reported in the whole of the territory. Influenza, as in previous years, has been responsible for the largest number of deaths—viz., 209—the number of cases is not known.

During the year 6 medical officers have been seconded exclusively for sleeping sickness work. No new foci of infection have been discovered, and the activities of the sleeping sickness staff have been mainly concentrated on the infected areas in the Tabora and Ufipa districts. The policy adopted in this enormous area, approximately 10,000 square miles in extent, has been to concentrate the population in fly-free clearings. The disease shows no sign of becoming endemic, and until the fly can be eliminated, or the inhabitants removed to fly-free areas, sporadic cases will continue to occur.—*Lancet* 2:1219-1220 (Dec. 3,), 1927.

Health of Northern Ireland, 1926—The fifth annual report of the Registrar-General relating to Northern Ireland in 1926 gives the number of inhabitants of Northern Ireland as 1,256,322. The birth rate fell steadily from 1920, with the exception of 1923 and 1926, in which years there were slight recoveries. The death rate has varied considerably; it was high during the war years, and then fell steadily until, in 1923, it reached 14.9. In the following year an epidemic of influenza and a high rate for respiratory diseases resulted in an increase to 16.1, but since then there has been an annual decrease, and the rate of 15.0 for 1926 is the lowest recorded during the past 10 years, with the exception of that registered for 1923. Deaths from tuberculosis continued to decrease, but still represent nearly 10 per cent of the mortality from all causes. In the age period 15 to 25 this disease is responsible for over 54 per cent of deaths, whereas in the following 10-year period the proportion falls to 44 per cent. Deaths from influenza in 1926 totalled 482, being less than half the average for the past 10 years.

Heart disease was the chief cause of death, and is followed by tuberculosis and cancer; the death rate from this last

condition has risen each year from 1922 to 1925, but was slightly lower in 1926. There was a slight increase in the mortality due to encephalitis lethargica and cirrhosis of the liver.—*Brit. M. J.* Jan. 7, 1928, p. 29.

Health Conditions in New York State, 1927—The health of the people of the State of New York in 1927 was exceptionally good. The death rate (12.3 per 1,000 population) was never lower and was equalled but once in 43 years. Infant mortality (59 deaths under one year per 1,000 live births) was the lowest recorded since 1904, when these deaths were first compiled separately. The birth rate (19.9) was practically identical with that of 1926.

There was a drop in the death rate from diseases of the heart. We must not, however, ascribe too much significance to this decline because the high death rate in 1926 was directly influenced by the abnormally severe weather during the first months of the year. The present death rate from diseases of the heart, with the single exception of the preceding year, is still greater than ever before. The death rate from pneumonia (107.2 in 1927) declined 28 per cent and the proportion of deaths due to this cause was only 8.7 as compared with 11.1 in 100 deaths last year. The death rate from pneumonia in 1927 was, with one exception, the lowest ever recorded. Cancer, with the highest mortality (124.3) on record, is now second among the causes of death. A year ago it was third, in 1917 it was fifth, and 20 years ago it was eighth. The death rates from nephritis, acute and chronic, 82.7 and from tuberculosis, all forms, 81.9, have never been lower. The decline in the tuberculosis death rate was the greatest recorded in any one year since 1921 and the 1927 rate was one-half of the rate recorded only 10 years ago.

New minimum points were reached by typhoid fever (1.7), measles (1.6),

diarrhea and enteritis under 2 years, (13.1), bronchitis (5.0). The mortality from whooping cough (4.2) was lower only once since 1885. On the other hand, the continued decline in the death rate from diphtheria was broken with an increase from 6.4 to 8.6. The diabetes death rate (24.4) was practically the same as in 1926, which, next to the rate of 1922, was the highest in 20 years. The death rate from automobile accidents (21.2) continued to rise, the suicide rate (16.0) was the highest since 1915, and the rate from homicide (5.0) was higher but once in a score of years. The mortality from alcoholism (8.1) was identical with that of 1926. Cases of diphtheria increased by almost 7,000 as compared with 1926; there was also an increase of more than 200 cases of poliomyelitis, 13,000 cases of scarlet fever, 5,000 cases of chickenpox, and almost 15,000 cases of mumps.—New York State Dept. of Health. *Health News* 5:25-26 (Feb. 13.), 1928.

Vital Statistics of Great Britain, 1927—The British birth rate of 16.7 per 1,000 is the lowest recorded since the establishment of civil registration. The rate in 1926 was 17.8. The death rate was 12.3 which is 0.7 per 1,000 above that of 1926. The infant mortality rate was 69 per 1,000 births which is equal to the 1923 rate, the lowest on record.—*New York Times*, Jan. 20, 1928.

Rheumatic Fever and Heart Disease in London—Recent estimates indicate that from 40 to 50 per cent of the recorded mortality from heart disease is rheumatic in origin. At early ages this proportion is doubtless considerably greater but the studies that have been made fail to show any clear evidence

that the mortality from heart disease at any particular age period is especially associated with the prevalence of rheumatism in the different areas. Assuming the rheumatic fever mortality rate to be an approximate index of rheumatic prevalence the local incidence of the disease shows a general tendency to be more common in the areas where the conditions of life are least favorable. There is a closer relationship, however, between unfavorable environment and the mortality from heart disease at the early ages in which the majority of the cases are undoubtedly of rheumatic origin. This correlation appears to be practically equivalent at ages 15-24, 25-44, and 45-64 and is generally more intensive than that between the mortality from rheumatic fever and heart disease at any of the corresponding ages. The mortality from cardiac disease in females seems to be more closely related to environmental conditions than in males but it is difficult to decide whether this is due to the more continuous and prolonged exposure of the female population to the deleterious influences of the unhealthy home.

Previous studies have shown a positive correlation in the county divisions of England and Wales between the rheumatic fever mortality and the general prevalence of damp and cold weather as well as with the mortality from organic heart disease. In London, however, perhaps because of more uniform weather conditions, there is smaller variation in the mortality rate from rheumatic fever and a less definite association with the incidence of heart disease.—Matthew Young. *Some Observations on the Mortality from Rheumatic Fever and Heart Disease*—*Lancet*, 2:1069-1070. (Nov. 19), 1927.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

STUDIES ON THE USE OF CHLORINE IN SEWAGE TREATMENT

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IN coöperation with the Chlorine Institute and the town of Chapel Hill, N. C., the Division of Sanitary Engineering of the University of North Carolina has begun a series of studies on the use of chlorine in sewage treatment. The university and town are served by two sewage treatment plants. One plant consists of an overloaded Imhoff tank, located at some distance from town and frequently receiving sewage in a septic condition, which provides only screening and plain sedimentation of the strictly domestic sewage, and discharges it into a small stream of low velocity flowing for a distance of more than four miles below the plant before receiving any tributaries. This plant affords ideal conditions for studying the effects of chlorine on foaming, hydrogen sulphide production, disinfection, reduction of biochemical oxygen demand, sludge digestion, and the progressive oxygen demand down-stream. The other treatment plant, of smaller size, is located nearer the town, receives fresh domestic sewage, and consists of a primary Imhoff tank, lath trickling filters, and secondary Imhoff tank discharging its effluent into a small, but rapidly flowing, brook. This plant is suitable for studies of the effects of chlorination on secondary treatment processes.

The scope of the investigation as at present projected may be summarized

under the following headings:

1. Correction of foaming in Imhoff tanks
2. Study of chlorine demand of raw sewage and tank effluents under different seasonal conditions
3. Effect on plant operation of chlorination of sewage in long outfall line at various distances above treatment works
4. Hydrogen sulphide control in plants
5. Effect on biochemical oxygen demand of effluents by prechlorination and postchlorination
6. Effects of various degrees of chlorination on progressive oxygen demand in water of stream below plant
7. Disinfection efficiency of various amounts of chlorine applied before and after sedimentation in Imhoff tank
8. Effect of chlorination on sludge digestion as indicated by pH, mineralization, quantity and quality of gas production

Recording devices are provided for measuring the flow of sewage and that of the receiving stream. An injector-type chlorinator, housed in a portable building, can be moved to any desired point of chlorine application. The chlorine and chlorine equipment are furnished by the research division of the Chlorine Institute, while the town of Chapel Hill has built the necessary structures, gaging and sampling stations, and assists in the conduct of the work.

These studies have been in progress since the fall of 1927, and will probably be continued for a period of a year, or longer.

The Effects of Storage Upon the Quality of Water—The quality of stream water depends upon the proportion of ground water to run off water present. In dry weather there is proportionately more ground water than surface water in the stream, and proportionately greater quantities of inorganic salts are present. This is conducive to development of algae, which, in the presence of sunlight because of their chlorophyl, are able to combine these salts with dissolved carbon dioxide and thus obtain their food supply.

Ninety-nine per cent of the normal strains of pathogenic bacteria disappear at the end of a week's storage and all of them at the end of a month. Water initially good obtained from an upland source will not be improved much by storage; in fact, a deterioration may result. Water from a larger river will almost invariably be improved.

In general, under these conditions, storage will result in decided decreases in: (1) Concentration of organic and inorganic solids by sedimentation; (2) concentration of organic impurities by precipitation and oxidation; (3) color in upper layers by oxidation and the bleaching action of sunlight; (4) concentration of hardness forming salts due to loss of CO_2 by diffusion, on utilization by plants, and by absorption of these salts by plants and animals during growth; (5) the number of bacteria; by sedimentation, exhaustion of food supplies and utilization as food by other forms of life.—A. Gordon Gutteridge, *Health, Commonwealth of Australia*, 5: 35 (Mar.), 1927. Abstr. L. M. Fisher.

Pressure Filtration Plant—A mechanical filtration plant to remove peat stain and counteract plumbo-solvent action in a portion of the water supply at Bradford, England, is described. The supply is from peat lands containing humic acid. Water must be treated with an alkali to prevent lead poisoning. Sul-

phate of alumina and lime or chalk are added for coagulation, removal of color, and neutralizing the acidity. The chemicals are fed as solution through plunger pumps operated by variable speed direct current motors. The speed is varied automatically with the flow by means of a Venturi meter which actuates a mercurial differential gear which in turn operates a small electrical rheostat.

The decision to adopt mechanical filters in this instance was reached chiefly on account of the following considerations, viz: (a) There is no suitable site on which to erect slow-sand or open gravity filters between the reservoir and the first point of delivery; (b) peaty discoloration can be effectively removed; (c) acidity can be readily neutralized, thus removing or reducing metallic solvency and corrosion; (d) initial cost of construction is less than that of slow-sand filters; (e) contamination from the air and the encouragement of the growth of algae are avoided, as the filtrate is delivered direct to the district of supply; (f) no interruption from frost; and (g) the bacterial purification is as efficient as in slow-sand filtration. The operating and maintenance charges are higher, owing to the cost of the coagulant—sulphate of alumina—used to effect color removal, and the wash water used may be greater, owing to the increased burden on the mechanical filters arising from the decolorization process. But these factors are largely, if not entirely, offset by the interest received on the greatly reduced capital expenditure for the mechanical filters, which entirely remove the peaty stain and give a clear, colorless water.—Anon. *Water Works*, 66:11 (Jan.), 1927. Abstr. E. A. Reinke.

The Standard Milk Ordinance in North Carolina—In 1924, as a result of a preliminary survey, it was found that 21 North Carolina cities had adopted a milk ordinance of some sort and were carrying on control measures. A study of the ordinances brought out very strongly the fact that there existed a great variance in the requirements.

Since it was almost impossible to bring about a uniformity in all the ordinances, the State Board of Health recommended to the cities the U. S. Public Health Service Standard Milk Ordinance. This was done for the following

reasons: (1) Uniform standards of quality were considered to be of basic importance; (2) uniform standards of milk sanitation were advocated; (3) the ordinance was found to be complete, fair, and practical; (4) classification of milk by grades is a sound principle on which to base the establishment of widespread uniformity of milk sanitation standards; (5) it was recognized that the services of an official correlating agency, such as the U. S. Public Health Service, was essential to the widest adoption of uniform, reliable standards.

Of the 21 cities in 1924 that had milk ordinances, 17 have adopted the Standard Milk Ordinance in place of the one they had. In addition, 16 other cities have adopted the Standard Milk Ordinance, thus making a total of 33 having it in effect. Ten cities with populations between 5,000 and 10,000 and 8 cities with populations less than 5,000, have adopted this ordinance.

The main features of the Standard Milk Ordinance are given, together with a discussion of the importance of further safeguarding a high grade raw milk by proper pasteurization, since health authorities are now convinced that no milk can be considered entirely safe in its raw state, no matter how carefully its production is safeguarded.—Malcolm Lewis, *Health Bull.*, North Carolina State Bd. of Health, 42:13 (June), 1927. Abstr. P. R. Carter.

Regarding the Procedure in Sludge Digestion—The process of decomposition in the sludge chamber in the presence of excess and subnormal pressure was investigated. An excess pressure had no influence on the gas production or even on the general decomposition of the organic material. With subnormal pressure, in contrast with the studies of Watson and Watsaws, an increase of the generated gas occurred, evidently on account of the more rapid withdrawal. A more rapid decomposi-

tion of the organic material did not, however, take place under these conditions. In opposition to other authors, light had no effect on the process in the digestion chamber. Phenols in the sewage affected the gas-forming bacteria more unfavorably than the liquefiers. Higher sulphates in the sewage resulted in higher hydrogen sulphide content in the gas. Introduction of oxygen delayed and injured the digestion process, as the rapid development of the hydrogen sulphide oxidizing bacteria was arrested. Sewage containing sulphates delays the decomposition process and in such cases larger digestion tanks are therefore essential. Acid sewage modifies the digestion process, especially by slight changes of the hydrogen ion concentration. The addition of 10 g. of chlorine to 1 cbm. of sewage sterilizes the precipitated sludge so completely that its ability to decompose is practically destroyed. Sodium chloride solutions up to 1 per cent have absolutely no effect on the sludge digestion process; up to 3 per cent it is decreased about 20 per cent. These phenomena are explained by a peptonizing action of the salt on the sewage colloids. Sodium chloride diffuses only slightly in sludge mixtures and also the salt in the sludge diffuses very slowly in the surrounding water. Therefore, the amount of sodium chloride present affects the regular automatic conversion of sludge in the digestion tank. F. Sierp. *Tech. Gemeindebl.* 29, 21-24. Translation of an abstract in *Zentralbl. f. d. ges. Hyg.*, 15:496 (Aug. 10), 1927. Abstr. J. K. Hoskins.

Human Ascaris As a Household Infection—An attempt to shed light upon the etiology of Ascaris infestations from a study made in a section of the Republic of Panama is reported. In the rural areas there, human excrement is not used for fertilizer and the source of drinking water is in most cases free from any possibility of fecal contamination,

yet the *Ascaris* incidence varies from 40 to 90 per cent. The author was able to estimate that the number of ova passed per diem in 8 different households ranged from 2,970,000 to 99,960,000, individual persons varying from negative to 64,760,000. The unique character of this study, however, was the demonstration by a flotation method, of *Ascaris* and *Oxyuris* ova, containing motile embryos, in the sweepings from the dirt floors of the homes and door-yards. This leads to the conclusion that such places "are a source of *Ascaris* infection of considerable importance." It was possible, experimentally, to demonstrate that *Ascaris* ova in feces under typical local conditions would reach the motile embryo stage in 14 days. Harold W. Brown, *J. Parasitol.*, 13:206 (Mar.), 1927. Abstr. N. R. Stoll.

Experience in Destroying Sewage Screenings By Burning—The sewage screening and screenings disposal plant at Long Beach, Calif., is located near a popular bathing beach which necessitated careful designing and required special operating attention to avoid the creation of a nuisance. Details of the plant design and operation are given by the author who was formerly superintendent of the sewage works at Long Beach.

The old plant was remodeled in 1924 and an additional unit built so as to insure continuous operation on a 24-hour basis. The combustion chamber and the ash pit of the new unit are lined with refractory material, and all walls and roof insulated with the same. Gas is used for fuel and a temperature ranging between 1600° F. to 1850° F. is maintained. This temperature was found to be most satisfactory, as higher temperatures produced clinkers hard to dispose of. The rate of burning in the old unit was about 10.5 lb. of screenings per minute, but in the new unit a much greater amount is handled at less than

half the fuel cost. The screenings removed from Long Beach sewage average 30.7 cu. ft. per m.g., but during the canning season (fish and tomatoes), peak loads run as high as 45 cu. ft. The cost of burning the screenings is estimated at \$4.025 per cu. ft., which includes fuel and labor. Although the nearest houses are only 75 ft. from the incinerator stack, no complaints about the operation of the plant have been made.—Robert A. Appleton, *Eng. News-Rec.*, 99:500 (Sept. 29), 1927. Abstr. Ella G. White.

The Disappearance of Typhoid Bacteria in Water—For a study of the reasons for the disappearance of typhoid bacilli in water, water samples from different sources were inoculated with typhoid organisms and stored under similar conditions. The types and numbers of protozoa occurring in the water were also observed. The typhoid bacilli disappeared from tap water, rain water and water from a swimming pool in from 7 to 10 days and their disappearance corresponds with a marked increase of a bacteria-eating protozoon—*Oicomonas termo*, *Cercobodo alexieffii*, *Cyclidium glaucoma*. With ground water the result was less marked. In one of the experiments, the bacilli disappeared only after 4 weeks in spite of the presence of the same protozoa; in another they were not present after 13 days, while in water from the same source that had been freed from protozoa by filtration they remained 4 days longer. It is concluded that at present unknown factors other than bacteria-eating protozoa are also responsible for the disappearance of the typhoid organisms.—N. L. Wibaut and Isebre Moens, *Verslag d. afdeel. Natuurkunde koninkl. akad. v. Wetensch.*, 36:129. Translation of abstract *Zentralbl. f. d. ges. Hyg.*, 15: 486 (Aug. 10), 1927. Abstr. J. K. Hoskins.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M.D. AND LEONARD GREENBURG, PH.D.

Health of Office Workers—According to the federal census in this country in 1920 there were about 3,100,000 persons engaged in clerical work, but interest in their health matters has lagged behind that of the regular industries. Ramazzini in 1713 remarked upon the maladies of clerks who were mostly males in those days; and Thachrah reëmphasized the same in 1831. Today the members of most clerical groups are predominately feminine and unmarried, young rather than middle aged or aged, city or town dwellers, and they may present a selection of persons physically substandard. According to the census, in two large groups, "other clerks," and "stenographers and typewriters," over 51 per cent of both sexes were in the age group 15 to 24 years, and of females, 61 per cent. Tuberculosis of the lungs caused 46 per cent of the deaths in this young age group, with heart disease, Bright's disease, accidental violence and pneumonia, following in the order named. The mortality in this group for tuberculosis was 170.7—highest for all occupational groups. (The paper then discusses in detail various statistics based upon the census and especially the data available in the Home Office of the Metropolitan Life Insurance Company.) In general, females are not only more frequently absent but lose more days from sickness than males, thus, in 1925 males lost 8.82 working days, females 12.44, or 141 per cent of the male rate. However, men averaged 7.08 days absence and women only 4.41 days. Among males there were 1.246 cases of absence per clerk-year; among

females 2.824, or 226 per cent of the male rate. A most interesting feature of this study was that sick absence varies quite directly with age; that is, a woman of 25 will in all likelihood have a worse sickness absence record than one of 20.

Distribution of sickness by departments in the organization, of which there were 188, showed that the worst had an experience about 65 times that of the best! Of little importance is consideration of causes of sick absence and it is recommended that the *International List of Causes of Death* be used as a basis for a standard nomenclature in dispensary practice. Of illnesses causing absence among males and females combined over 38 per cent were due to respiratory diseases; 27 per cent to diseases of the digestive tract; and over 11 per cent of the cases among females to dysmenorrhea. Sickness calls in the Metropolitan employes during 1925 and 1926 total more than 150,000, mostly, of course, unattended by absence. The curve of absenteeism drops in mid-summer, rises in the fall, drops slightly in early winter, and then rises in a late winter peak. There are two separate types of colds, one of the fall type, the other occurring in mid-winter; there is also a strong suggestion of a relation between a drop in the mean temperature and an increase in colds. This is contrary to a warmer climate such as California, where the incidence of colds varies greatly without marked change in temperature. (The various afflictions of clerical workers are discussed in detail with accompanying tables and graphs.) "Employers of clerical workers cannot

ignore the importance of the problem of time and efficiency lost through disease and it is almost inevitable that they share with their employes the burden of maintaining some mechanism for the relief and control of the situation. The problem is not so much the reduction of sick absenteeism to the lowest possible limit as it is the maintenance of the healthiest possible group of workers."—Wade Wright, *Proceedings of the Convention, The Life Office Management Association (Metropolitan Life Insurance Company)*, Oct., 1927, 35 pp.

Toxic Risks of Spray Painting—At the third conference on Industrial Hygiene held in Melbourne in May, 1927, the following resolution was adopted:

(a) Lead paint should not be used in interior painting. The use of lead paints in spray-painting under any circumstances must be regarded as dangerous, and the use of non-lead paints should always receive consideration.

(b) Commercial spray-painting in interiors should be done in properly constructed booths, provided with efficient mechanical exhaust ventilation. The exhaust systems should be so constructed and installed as to operate effectively, independent of weather and adjacent building conditions.

(c) The booths act as extraction-dust ventilating units, and the spray operator should not be exposed to dust and fumes drawn past him to the exhaust fan.

(d) The exhaust system should produce a satisfactory uniform air movement at the booth face under working conditions.

It is recommended also that employes engaged in spray-painting should—

(a) Not spray at right angles to a flat surface, so causing the spray to roll back

(b) Not spray too large objects and thus get out of range of the exhaust

(c) Not spray promiscuously about the room in testing the sprayer

In the matter of safeguards regarding volatile solvents, etc., the special committee recommended that paints, etc., containing benzol should not be used nor should benzol as such be added to any paint material. Where penetrating stains and removers containing benzol

are used, as many men as practicable should be employed to minimize the period of exposure to the injurious effects of benzol. Shellac dissolved in wood alcohol should not be used, nor should wood alcohol as such be used in any painting operation. Dr. J. I. Moore, Commissioner of Public Health for Queensland, *Med. Off.*, Jan. 21, 1928, p. 33.

The Determination of Carbon Monoxide in Mines With the "Iodine Pentoxide" Detector—The various methods commonly used by the Bureau of Mines for detecting carbon monoxide include the use of canary birds and mice, the pyrotannic acid method in blood samples, volumetric gas analysis, and the iodine pentoxide method. This is also known as the hoolamite method. (The article contains a description of the detector which is composed of a short barrel about 1 inch in diameter and 6 inches long to which is attached a rubber bulb, a tube containing the hoolamite and the indicator tube.) By using more samples of the air, amounts as low as 0.05 per cent can be estimated. While the hoolamite detector does not indicate a deficiency of oxygen or the presence of other gases as carbon dioxide and hydrogen sulphide, nor give warning of the presence of carbon monoxide unless it is actually used (differing from a canary), it affords a reasonably accurate quantitative means of determining, while underground, the percentage of carbon monoxide in the air, which it is impossible to do with small animals. It is an extremely valuable tool in mine rescue work.—G. S. McCaa and John A. Davis, *Circular No. 6057*, U. S. Bur. of Mines, Jan., 1928..

Anthrax Hazard in Pennsylvania—In view of the recent report of several fatal cases in one plant in Philadelphia in recent weeks, it is well to call attention to the carefully detailed study of

14 fatal and 75 non-fatal cases of anthrax which have occurred in Pennsylvania during the 5 years ending 1926, by Dr. Elizabeth B. Bricker, Department of Labor and Industry, Pennsylvania, *Month. Labor Rev.*, 25, 6:1261, (Dec.), 1927.

Prevention of Hydrogen Sulphide Poisoning in Handling and Refining High-Sulphur Petroleum—Several fatal accidents have occurred in the oil fields and at refineries from hydrogen sulphide poisoning. The general characteristics of this gas show that it is heavier than air, is colorless, and has a characteristic odor known as "rotten." It burns in air with a blue flame yielding sulphur dioxide and water vapor. It is therefore an "acid" gas. It becomes less soluble in water as the temperature is raised from the freezing point. It is a highly corrosive agent, leads to blackening of white lead paint, and is extremely toxic, in this respect more so than hydrocyanic acid gas. In high concentration it quickly deadens the sense of smell and the margin between consciousness and unconsciousness and death is very narrow. "Probably one breath of the gas may be sufficient to cause asphyxiation." Exposure to low concentrations causes irritation of the eyes and of the respiratory tract. (The paper next discusses the treatment of victims, the places of danger in the oil refining industry, descriptions of typical cases of poisoning, and the details of precautions necessary in the care of apparatus, tanks, etc. An appendix gives a satisfactory method for the determination of hydrogen sulphide by titrating with iodine solution.)—H. C. Fowler, *Serial No. 2847*, U. S. Bur. of Mines, Dec., 1927, 27 pp.

Ozone Fallacy in Garage Ventilation—Dr. Salls presents a discussion of the literature concerned with the reaction of carbon monoxide and ozone, and

from this discussion one must conclude that there is great variance in the literature concerned with this reaction.

The experimental studies which Dr. Salls presents are analyses of the atmosphere from a gassing chamber in which carbon monoxide is mixed with ozone at room temperature. The atmosphere was sampled from the beginning of the mixture of the gases to a period 140 minutes thereafter. The carbon monoxide determinations were made by means of the Sayers-Yant method, using defibrinated steer's blood as a blood reagent. Three samples of the atmosphere were obtained prior to starting the ozonator, the three samples yielding the following results in chronological order: 13, 9 and 7 parts of carbon monoxide. After allowing the ozonator to operate for about 20 minutes, a sample was taken which yielded somewhat less than 5 parts of carbon monoxide. Subsequent samples were taken to the end of 140 minutes. When these samples were plotted against time they fell on a fairly uniform curve which appears to be the curve of absorption of gas by the chamber walls and leakage through them. The starting of the ozonator appears to have altered the shape of the curve in no way.

Dr. Salls concludes that this study indicated no evidence of an appreciable action of the ozone on the carbon monoxide.—Carroll M. Salls, *J. Indust. Hyg.*, IX. 12:503. (Dec.), 1927. L. G.

Review of Literature on the Physiologic Effects of Abnormal Temperatures and Humidities—Among the rather lengthy conclusions reached in this study we note the following:

The upper limit in atmospheric conditions at which work can be performed efficiently corresponds to a dry-bulb temperature of 100° and a relative humidity of 30 per cent, or 90° to 95° F. in still saturated air, even when stripped to the waist. The optimum temperature at rest is around 66° F.; and with hard work the optimum temperature is 59.5°; 43° F.

was pronounced as too cold with or without air movement, regardless of humidity. In still air no temperature is too low to prevent outdoor work.

The lowest temperature compatible with life is said to be 78.8° F., although LeFèvre found that a rabbit died when the temperature of the rectum had fallen to between 60° and 65° F.

The minimum accident frequency, according to one observer, in factory work in both men and women was at 65° and 69° F. . . . At temperatures above 69° the accident frequency showed only a slight rise in women, but in men it increased rapidly, and at temperatures above 75° it was 39 per cent greater.

During the 16 months preceding the installation of the cooling plant in the Morro Velho mine there were 20 fatal accidents, while during the 16 months period following the installation there were only 6 fatal accidents.

(Many other interesting conclusions are found in this report.)—R. R. Sayers and S. J. Davenport, *Pub. Health Rep.*, 42:933, 1927.

Degree of Nicotine Action on Workman's Organism From Inhaled Tobacco Dust—This study was designed to answer the following specific questions with reference to the problem of nicotine action on workman's organism: (1) the quantity of tobacco dust inhaled by a workman; (2) how the inhaled dust is distributed in the body; (3) how much nicotine is present in the dust; and (4) what amount of the nicotine is alkalized by the different juices of the human body.

The method of making dust estimations is not given but the author pre-

sents data showing that from 2.8 to 17.3 milligrams of dust were inhaled by workmen during one hour. Of this amount a portion was obviously exhaled, a certain portion retained in the nose, and a certain portion, from approximately 9 to 55 mg., penetrates into the lungs during a period of 24 hours of exposure.

In attempts to estimate the degree of nicotine alkalization by different body juices, the author has experimented with saliva, gastric juice, physiological saline and intestinal juice to which pancreatic juice or bile, or both, were added. From these experiments the author concludes that the total nicotine intake from inhaled tobacco dust during an 8-hour workday ranges from 0.3 to 1.9 mg., depending on the process at which the worker is engaged. He concludes that the workman employed at rubbing tobacco, the dustiest process, absorbs as much nicotine from the dust as he would by smoking 5 cigarettes a day. This small amount of nicotine certainly does not explain the cases of nicotine poisoning which have been observed, and the author is of the opinion that the atmosphere of tobacco factories contains volatilized nicotine in free condition which is more capable of producing action than is inhaled dust. The average nicotine content of tobacco dust on the basis of several analyses performed by the author proved to be 1.73 per cent.—A. Burstein, *J. Indust. Hyg.*, IX. 12:512. (Dec.), 1927. L. G.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Blood Regeneration in Severe Anemia—X. Assimilation and Conservation of Bile Pigment, Blood Hemoglobin and Muscle Hemoglobin—Hemoglobin prepared from normal dog blood in isotonic saline solution was injected hypodermically into anemic dogs, both intravenously and intraperitoneally. Muscle hemoglobin free from blood hemoglobin was also tried, as was a pancreatic digestion of red blood cells of the dog administered in an alkaline medium. The intravenous injection of dog hemoglobin in varying amounts resulted in all instances in a conservation of the injected hemoglobin amounting probably to 90 per cent or more. While muscle hemoglobin is utilized to form new hemoglobin it is not so satisfactory, as the dog can tolerate only small amounts of this substance compared with blood hemoglobin. Muscle hemoglobin solution is apparently toxic when fed in large amounts. A pancreatic digestion of red blood cells resulted in a regeneration of about 40 per cent and in the case of fresh blood cells given by mouth there resulted only a 7 to 10 per cent utilization, probably due to incomplete digestion of hemoglobin. Dried blood cells in the form of blood paste were fed with a 20 per cent utilization as a result. A number of experiments in bile feeding with dried ox and pig bile gave negative results. Fresh dog bile given by stomach tube or mixed with the standard ration showed some stimulus to hemoglobin production but in some cases results were negative. A discussion follows as to the probable site of the conservation of hemoglobin in the body.

XI. Iron Effect Separated from Organ

Effect in Diet—Experiments are recorded in which soluble iron salts corresponding to the iron content of about 300 grams of fresh spleen were added to the standard ration. These small doses resulted in production of an excess of 10-25 g. of hemoglobin, for 2-week periods, above control levels. Two hundred to 300 g. cooked spleen caused an increase of 20-50 g. in the same period. It was found, however, that dogs on a diet of iron salts may or may not respond with increased hemoglobin production depending on the condition of iron shortage. The addition of pig kidney and liver showed a marked increase. It is concluded that this summation of physiological effect of iron salts plus organs does not support the contention that the favorable influence of the feeding of these organs toward hemoglobin regeneration is due to the iron content.—F. S. Robscheit-Robbins and G. H. Whipple, *Am. J. Physiol.*, 83:60-83 (Dec.), 1927.

Studies on the Anemia of Rice Disease—On the theory that bacteremia in this disease is the result of gastrointestinal stasis, the effect of four procedures were studied—first, increasing the acidity of digestive juices; second, through the addition of vitamins A and C to correct deficiency; third, to alter the character of the intestinal flora by increasing acidophilic bacteria; fourth, altering the degree of absorption from the gastrointestinal tract by administering lactose, magnesium sulphate or mineral oil. Adult pigeons, averaging 360 g. in weight, were the experimental animals. The birds were placed on a mixed whole grain diet and after con-

stant weight had been established, records were made of body weight, respiration rate, rectal temperature, red corpuscle count, hemoglobin and blood sugar levels. The addition to the diet of betaine HCl, lactose, vitamins A and C, magnesium sulphate or mineral oil had no apparent influence on body weights, temperature and respiration. Betaine HCl or butter and orange juice in addition to the rice diet had no influence on the red corpuscle count. The addition of lactose, magnesium sulphate or mineral oil prevented anemia in a large percentage of cases. Magnesium sulphate, mineral oil or lactose did not change the blood sugar concentration. It is concluded that the beneficial effects observed in rice disease, so far as the red blood cell count and hemoglobin levels are concerned, following the administration of mineral oil or magnesium sulphate and lactose, is explained by the catharsis and limitation of intestinal bacteremia.—O. W. Barlow, *Am. J. Physiol.*, 83:237 (Dec.), 1927.

Food Poisoning—This is an epidemiologic study of 425 outbreaks of food poisoning in the United States during 1923, 1924 and 1925. It is admitted that accurate statistics are difficult to obtain on account of the fact that food poisoning is rarely required to be reported, although such reports are required in the States of Georgia, Kansas, Maryland, Montana, New Mexico, Oklahoma, Washington, Wyoming and West Virginia. Botulism is a reportable disease in Colorado, Connecticut, Arizona, Idaho, Kansas, Maryland, New York, Minnesota, Oregon, Washington, California, West Virginia and Wyoming. A summary of the data available for the period 1910-1925 inclusive, shows 7,112 cases with 544 deaths, indicating a case mortality of 7.6 per cent. It was concluded that this figure does not accurately represent the mortality owing to analyses of necropsies in assigning

the cause of death. A careful study of the records, selecting those cases in which laboratory evidence was reasonably conclusive that the cause of the outbreak was the paratyphoid group, shows a case mortality of 0.4 per cent. Four hundred and twenty-five investigations of alleged food poisoning are summarized for 1923-24 and 1925. The outbreaks bear no relation to the time of the year. Geographically, the greatest number were reported in the middle west, followed by the southern group, the western group and the smallest number in the east. Of the foods alleged responsible, 401 were commercially canned and 70 prepared in the home. The type of food involved was chiefly meat products, fish, vegetables and fruit. It was apparent that neither age nor sex has any incidental influence on the distribution of outbreaks. Of 425 outbreaks, in 28 the food was regarded as manifestly spoiled or off in taste or odor. Of these, 23 were outbreaks of botulism. Eight cases of botulism are recorded in which the food was stated to be normal in odor and taste. Sixty-six cases out of 425 recorded are classified as being caused by the paratyphoid-enteriditis group of organisms, although the majority are not supported by laboratory evidence. In 32 per cent of the series reported, the diagnoses were given by attending physicians as "ptomaine poisoning." The same term was also used by newspaper reporters and others. It is insisted that this loose term should be promptly discarded by the medical profession and that the diagnosis of food poisoning should be supported by epidemiologic, bacteriologic and toxicologic investigation.—*J. A. M. A.*, 90: 459 (Feb. 11), 1928.

Vitamins A, B and C in Collards and Turnip Greens—In determining vitamin B, normal albino rats, 28 days old, and of uniform weight as nearly as possible, were used. All animals were

kept under the same conditions of light and heat, and were fed at a nearly uniform hour seven days a week for 8 weeks. The diet was devoid of vitamin B and distilled water was given *ad libitum*. It was found that 0.8 g. raw turnip greens and 0.9 g. raw collards were sufficient for maintenance over a period of 8 weeks. Cooking according to the process described caused a 10 per cent destruction of vitamin B in turnip greens and 40-45 per cent in collards. In determining vitamin A, rats 28 days old, weighing 40-55 g. were used; 0.02 g. raw turnip greens was more than sufficient to produce growth of 25 g. in 8 weeks, and 0.02-0.04 g. collards was sufficient to give standard growth. Cooking showed no appreciable destruction of vitamin A. In determining vitamin C, guinea pigs were used. The experimental diet consisted of 59 per cent whole ground oats, 10 per cent butter fat, 1 per cent sodium chloride, and 30 per cent skim milk powder. It was found that 0.5 g. of raw collards and more than 1.0 g. of raw turnip greens were required to prevent scurvy. Cooked collards, equivalent to 10 g. raw, gave protection, while cooked turnip greens, equivalent to 8 g. raw, were not sufficient and the animals refused to eat more. Tables are given in each instance showing the growth and survival of rats during the 8-week period.—G. W. Burton, *J. Home Econ.*, 20:35 (Jan.), 1928.

A Milk-Borne Epidemic of Poliomyelitis—In October, 1926, in Broadstairs, England, there occurred an unusually severe outbreak of poliomyelitis which presented features not generally encountered in epidemics of this disease. This outbreak started and subsided suddenly, 62 cases being reported between October 14 and 29. The epidemic was confined strictly to Broadstairs and did not extend to the adjacent cities. These localizing features were rather unusual.

Evidence of flaccid paralysis was obtained in 43 of the cases while 28 cases were classed as non-paralytic, although some of them exhibited encephalitic symptoms. It was observed that the encephalitic type of the disease was much more common in this epidemic than in the experience of the writer in the United States. Investigation disclosed that practically all the cases among the residents of Broadstairs were supplied with milk from the same dealer. The evidence concerning the milk supply pointed strongly to the milk furnished by this dealer as the common source of infection, and further suggests that contamination of only one grade of his milk which came from a single farm, was responsible for the epidemic. The author further concludes that the distribution of cases of poliomyelitis in the Broadstairs epidemic in point of time indicates that the majority of cases were simultaneously infected. It is also inferred that the incubation period in the majority of cases was between 6 and 14 days. The age distribution in this epidemic differs from that usually observed, in that most cases occurred between the ages of 5 and 15. This is largely accounted for by the cases in boarding schools and convalescent homes located in this city whose population consisted largely of children between these ages.—W. Lloyd Aycock, *Am. J. Hyg.*, 7:6 (Nov.), 1927.

Food Poisoning Probably Caused By *Bacillus Proteus*—A report of poisoning among students at Colgate University, Hamilton, N. Y., October 4, 1927, the cause of which appeared to be chicken which had been purchased on Sunday and not used until Tuesday. Fortunately some of the chicken was secured and *B. proteus* found together with streptococci and colon bacilli. Samples from the vomitus and stools of the patients also yielded *B. proteus* which were found to be pathogenic for

guinea pigs. Symptoms are recorded which simulate those caused by the paratyphoid-enteriditis group of organisms.—Dr. Morrill L. Ilsley, *J. A. M. A.*, 90:292 (Jan. 28), 1928.

The Relation of Deficiency of Vitamin B to Atony of the Stomach
—Five rats of known history were placed on a vitamin B deficient diet supplemented with 1 per cent yeast extract for 6 weeks. Barium carbonate meals were then given and radiograms made, which disclose a distension of the cardiac portion of the stomach, in some of the rats so great as to be visible externally.

Control rats on a sufficient vitamin B diet were all radiographed showing no enlargement of the cardiac and the stomachs only about one-third the size of those on the deficient diet. Control rats were of the same weight as the deficient rats when the radiograms were taken. The authors conclude that the atonic conditions among some patients may be the result of vitamin B deficiency.—Dr. M. J. Rowlands and Dr. Ethel Browning, *Lancet*, 1:180 (Jan. 28), 1928.

The Possible Toxicity of Buttermilk Soured in Zinc Containers
—The investigators first confirmed the previously reported presence of zinc in fresh milk and cultured buttermilk and further found that cultured buttermilk dissolves considerable quantities of zinc in galvanized containers which amounts depend on the acidity of the milk and the time factor. Rats and swine were used as experimental animals, the former after being placed on the experimental diet were given buttermilk soured in glass and in both old and new galvanized utensils. Measured amounts of zinc lactate and zinc carbonate were

also administered in two lots. The lot fed 0.5 per cent of zinc lactate made fair growth and reproduced but a large proportion of the off-spring died, while the lot fed 1 per cent of the zinc carbonate made poor growth and did not reproduce. For tests with swine, 100 pound Hampshire gilts were the experimental animals, divided into 4 lots, one being fed 0.5 per cent of zinc carbonate, another plain buttermilk, a third buttermilk from a galvanized tank, and the fourth, cultured buttermilk held from 12 to 48 hours in new galvanized iron pails. In lot 1, after feeding zinc carbonate for 2 weeks, one animal developed stiffness of the hind legs but the mate was unaffected. Apparently no deleterious effects were observed in the case of sows which were fed buttermilk stored in galvanized tanks or pails. The authors conclude that small amounts of zinc lactate such as might be found in food does not markedly affect growth and reproduction in rats.—A. D. Burke and Frank Woodson, *J. Dairy Sci.*, 11: 79 (Jan.), 1928.

Determination of Vitamin A Content in Liver Oil of the Dog-Fish *Squalus Sucklii* (preliminary note)—The content of vitamin A in the freshly prepared liver oil of the dogfish (*S. sucklii*) was compared with that of a standard cod liver oil stated to contain 12,000 units of vitamin A per ounce, using curative and prophylactic tests with rats on the Zilva-Miura basal diet. Comparisons of the weight increases of rats given cod liver oil and the dogfish liver oil indicate that for equal volumes the dogfish liver oil contains between 5 and 10 times the number of units present in the cod liver oil.—H. N. Brocklesby, *Canad. Chem. & Metall.*, 11 (1927), 9:238, 239, figs. 2. Abstract. *Exper. Sta. Rec.*, 58:294 (Feb.), 1928.

CHILD HYGIENE

MERRILL E. CHAMPION, M.D.

The Mother-Fed Baby—Dr. Waller's address given to the Winter School for Health Visitors contains so many excellent points which are often insufficiently emphasized that it seems worth while to review them.

In many bottle-fed babies early loss of muscle tone becomes an important warning of faulty nutrition and particularly of oncoming rickets. Dr. Waller does not, however, feel that mother's milk is an infallible protection against rickets and urges that the effective diet and way of living on the antirachitic vitamin of mother's milk be borne in mind. It is quite possible this may account for the steady gain of some breast-fed babies whose mothers may not keep as neat homes as more conscientious mothers, but who do get out of doors daily into the sun and fresh air.

Immunity against the so-called children's diseases is not always certain in the breast-fed. Measles is rarely contracted before the seventh or eighth month. Most nursing mothers in this group had had measles, but so had the mothers of bottle-fed infants, and the most that could be claimed was that the incidence of measles was somewhat delayed in the breast-fed infants. Pertussis, however, is common any time after the first month of life, nor did breast milk appear to protect from this or from diphtheria and smallpox, although recent vaccination of the mother appears to lessen the chance of the baby's contracting smallpox. In cases of congenital syphilis Dr. Waller feels strongly that both the breast-fed baby and mother should be treated and not the mother alone. He agrees, of course, that the tuberculous mother should not nurse her baby. Breast milk not only

helps to combat disease when it occurs, but it is the only perfect food during the baby's illness and convalescence.

The close mental—and physical bond between the nursing mother and her baby was especially well brought out. While firmly supporting the principle of punctual feeding Dr. Waller feels that the strict separation of the mother from her baby during the lying-in period is "bad natural history." The mother "should be allowed to handle her baby and cultivate and indulge her maternal feelings."

Certain gastrointestinal disturbances occur in breast-fed children following such things as worry, quarrels, shocks, which affect the mother. A feed shortly after some such disturbance frequently provokes vomiting in the child, and sometimes this occurs with the return of the menses for 2 or 3 three days, but this is not to be taken as sufficient reason for stopping breast feeding. The breast-fed baby frequently runs a risk of catching its mother's cold, and this, in the neonatal period, is a serious occurrence. The mothers should be assiduously taught to mask themselves when feeding their infants. Colds, however, are generally less severe in the breast-fed than in the bottle-fed baby.—

Dr. H. K. Waller, *Maternity and Child Welfare*, Feb., 1928.

Rheumatic Infection in Childhood—Rheumatic infection in children is doubly serious in that it entirely disables them during the attack and also tends to produce permanent cardiac injury. This report from the Ministry of Health, England, is a study of the bacteriology, incidence and institutional treatment of acute rheumatism in children in connection with the prevention of heart disease.

Diseases of the heart and circulation account for 188 of every thousand

deaths. Of these 40 per cent are probably due to rheumatic infection. If we turn to the number of patients in hospitals with cardiac disease we find the cause is definitely acute rheumatism in 90 per cent of the cases under 10 years of age, 80 per cent between 10 and 20 years, 60-70 per cent between 20 and 40 years, so that nearly all cardiac deaths under 40 are due to "rheumatic infection." The poorer the home the greater the risk of infection; also the younger the children having rheumatic infection the more likelihood of cardiac involvement.

Rest being a great factor in the prevention of permanent heart damage following infection, institutional treatment seems to be indispensable. Treatment in the child's home or at the ordinary convalescent home is rarely successful. It is best done in institutions devoted entirely to cardiac patients. Complete rest in bed can, however, be over-prolonged. The standards now used in the institutions mentioned are complete rest until 3 weeks after, (1) the pulse-rate and temperature have become normal; (2) anaemia has disappeared; (3) the heart signs are unchanged. It should always be borne in mind that one attack renders the child more liable to another and every precaution should be taken to prevent recurrence.

(This study follows that made by the Ministry of Health, England, in 1924 and dealing with the insured population over the age of sixteen).—*Mat. & Child Welfare, London*, Jan., 1928.

Quantitative Study of Ultra-violet Transmitting Glasses—In view of the importance of the subject, it is highly desirable that as many studies as possible be made of the efficiency of ultra-violet transmitting glasses. The authors in their study used a series of quartz lenses and prisms so arranged as to enable them to select wave lengths or

groups of wave lengths and to make actual quantitative measurements.

The conclusion to which Goodman and Anderson come may be expressed by their final statement, which is as follows:

"In conclusion we would like to point out that a number of excellent window glass substitutes for transmitting the short ultra-violet rays of the sunlight are now available. We have discussed briefly the available data on the ultra-violet of sunlight, referring primarily to its variability in quality and quantity with time of year and weather conditions. We know of no evidence that has been advanced to substantiate claims that health would be improved by using such glass substitutes, and until carefully controlled experiments have demonstrated their value, their employment as an aid to health should be advocated with reservations."—Herman Goodman, M.D., and William T. Anderson, Jr., Ph.D., *Boston M. & S. J.*, Jan. 12, 1928.

Study of Stillbirths Occurring in 4000 Consecutive Deliveries—At the Woman's Hospital 4,000 deliveries were studied in connection with maternal mortality, infant mortality and stillbirths. As Dr. Lyon so aptly states, these 3 points illustrate statistically "efficiency and good treatment in a most impartial way" on any obstetric service.

Among these 4,000 deliveries there were classified as stillbirths those babies who never breathed even though the heart-beat continued after birth and those who were delivered between the 28th week and term. On this basis 105 stillborn babies and 104 mothers (1 case of twins) were gone over in careful detail. Autopsy was performed in 53 cases.

A separate study was also made of 41 cases in which the heart was heard during part or all of labor. An analysis of these 41 cases suggested that 8 babies

might have been saved if a different method of delivery had been used, and 12 others if earlier operative interference had taken place. In the remaining 21 of this particular group the stillbirths seemed unavoidable and a detailed summary of diagnoses is given. This article presents so valuable and comprehensive a survey of one of our most puzzling problems that we venture to quote the remainder of the summary in full. Presumably no maternal death occurred in the group studied as no mention is made of maternal mortality.

SUMMARY

1 There were 104 patients who had 105 stillborn babies, or 26 stillbirths per 1,000 deliveries.

2 There were 85 of these patients who had been attending the prenatal clinic, giving 21 stillbirths, among clinic patients, per 1,000 deliveries.

3 There were 25 patients who showed evidences of toxemia, and 4 of these had convulsions.

4 Nine patients among the 79 who had Wassermanns were 4 plus. One showed clinical evidences of syphilis. To these luetic mothers 2 babies were born with syphilis. No other babies gave any signs of syphilis.

5 There were 61 abnormal deliveries, 22 being by forceps and 39 by breech.

6 There were 90 patients who had normal pelvic measurements.

7 There were 37 premature babies and 44 were macerated.

8 There occurred 11 cases of prolapsed cord in 10 of which it was a contributory or actual cause of stillbirth.

9 There were 53 babies autopsied and 12 of these showed cerebral injury.

10 In 55 patients no fetal heart was heard on admission, and in 3 it was doubtful. The heart in 47 was heard on admission and in 41 of these subsequently during part or all of the labor.—

Edward C. Lyon, Jr., M.D., *Am. J. Obst. & Gynec.* Oct., 1927.

Great Britain's Shortage of Young People—"As an aftermath of the war, Great Britain expects within the next few years a considerable decrease in the proportion of boys and girls 14 to 18 years of age in the general population, with a corresponding decrease, estimated to be about 389,000, in the number seeking juvenile employment. This circumstance has inspired the authorities to recommend an investigation into all the prospects and conditions of juvenile employment in various areas and trades, an inquiry which will greatly add to the industrial information already in the hands of juvenile-employment committees, and thus at the disposal of parents, children leaving school, and welfare workers."—*World's Children*, Children's Bureau, Dept. of Labor, Feb. 24, 1928.

Hospital for Crippled Children, University of Chicago

THE Home for Destitute Crippled Children of Chicago is to transfer its main hospital to the campus of the University of Chicago, where new buildings providing 100 beds will be erected. Part of the present plant of the home will be maintained as an emergency hospital and free dispensary for the west side. The

hospital will remain under the jurisdiction of the institution, but the university will provide the medical care. This is the fifth hospital for children's work now connected with the university, and its addition means another step toward establishing a clinic similar to those in Vienna and Berlin.

PUBLIC HEALTH NURSING

MIRIAM AMES, R. N.

Tioga County Ends Demonstration Period—The Tioga County Maternity Nursing Service developed under the joint direction of the New York State Department of Health and the Maternity Center Association in 1925 has as its object: "The working out of practical methods and standards of maternity hygiene work in rural communities using as a basis the methods and standards employed by the Maternity Center Association in New York City." This work was part of the Sheppard-Towner program.

In the beginning, it was agreed that "no prenatal medical clinic will be started unless there seems to be a special need, but patients will be brought into contact with the local physicians by the nurses and we will try to have the work, ordinarily done at a clinic, done by the doctors for each individual patient." It was agreed to begin with Maternity Center technics and to make changes as they were indicated. There was only one change made: fewer postpartum visits were necessary to secure the same results.

December 31, 1927, closed the 2-year period of the demonstration. The work of the nurses has become generalized * and the County has appropriated sufficient money which, with the money received from the State County grant, will finance this county nursing service.

At the end of the first year, 72 per cent of the pregnant women in the county were receiving nursing care and 75 per cent of this group had been reported by the private physicians. The second year, 356 patients received care and more than one-half of them were reported by physicians. The majority

of the balance made personal application for the service. (There are approximately 375 births a year.)

The private doctors in Tioga County did everything possible to facilitate the development of this service. H. C.

* This experience emphasizes again that no adequate maternity service can be carried on without the development of a general service. Only when we consider everything that may affect the health, happiness and peace of mind of the pregnant mother do we give adequate care.

A Campaign Against Rickets—

A study of the vital statistics of the Mulberry Health Center district in New York City showed an unusually high death rate for infants from 6 months to 1 year with one-third of the deaths from pneumonia. It is believed that rickets causes a susceptibility to colds, bronchitis and pneumonia and, since rickets is almost universal among infants, it is hoped by reducing the prevalence of rickets the high infant sickness and death rate can also be reduced.

For this reason a campaign against rickets with the coöperation of physicians, midwives, health agencies, druggists, cod liver oil companies and prominent citizens has been launched by Mulberry Health Center, a branch of the New York Association for Improving the Condition of the Poor.

Talks illustrated by charts, slides and films are given to Mothers' Clubs, Parent Teacher Associations, etc., to stimulate interest in sunning babies during all months when this is possible and in giving potent cod liver oil regularly as a supplementary treatment.

Classes have been formed to teach mothers the harmfulness and the prevention of rickets. These classes reach

pregnant women and mothers of babies under 2 years. Classes for older girls receive instruction in infant care, including the importance of sunshine and "bottled sunshine."

The hope of Mulberry Health Center is to broadcast the knowledge of rickets and the saving properties of sunshine and cod liver oil through posters displayed in shop windows, libraries, banks, health and welfare organizations; through flyers which are left in every home; through a pamphlet, *Rickets Must Go*, which has been distributed to the educators in the district. This material used is available to other agencies. Information may be had by writing to Mulberry Health Center, 256 Mott Street, New York, N. Y. C. R. P.

Community Health Resources Studied—Surveys of one kind or another, dealing with either self-analysis or group analysis, are growing in popularity. In weighing the pros and cons of health services, these investigations are especially useful. A study of community health resources is being undertaken on a state-wide basis by the Department of Public Welfare under the auspices of the General Federation of Women's Clubs, and endorsed by the American Public Health Association. This organized effort on the part of so large a body of women, enlisted in behalf of public health projects, will, without a doubt, result in direct benefit to many communities.

The study is in the nature of a contest, and the award will be made to the state having the greatest proportion of Women's Clubs making studies. The award, which will be contributed by the American Public Health Association and the American Child Health Association, will be made at the close of the contest, March 31, 1928, in a form to be worked out in consultation with the official health agencies and the authorities of state and federal departments of health

—a wise provision designed to meet the immediate need of the particular state in question.—Suggested Outline for the Use of Women's Clubs in the Study of Local Nursing Services, *Pub. Health Nurse*, XIX, 12:620 (Dec.), 1927.

Cleveland's Study of the Needs of Chronic Patients—The facts brought out in the survey made by Cleveland of their problem of chronic patients may be helpful to other communities that are aware of the imperfections of the care which they are providing for this group. Howard Whipple Green, Secretary of the Cleveland Health Council, has given a brief analysis of this study in the November issue of *The Nation's Health*.

The 460 cases studied were patients either in hospitals or at the City Infirmary, or known to the nursing associations and family case working groups in June, 1927. They were chosen according to the definition of a chronic given by Dr. Ernest Boas as "one who requires hospital care for a period from 3 months to several years."

Of these 460, 26 per cent were in need of medical study for diagnosis and treatment; 52 per cent in need of nursing care only, and 22 per cent in need of custodial care only. Three hundred and ninety-eight of the 460 patients were classified as indigent, and 410 of them eligible for care in a city chronic hospital. At the present time a large number are occupying beds in hospitals for the acute which should be available for the acutely ill, and which are much more expensive to maintain than beds in adequate hospitals for chronics would be. A large number are also being cared for in the much overcrowded City Infirmary.

The age groups show 27 per cent under 40, and 60 per cent under 60 years of age, and of these a certain number could probably be returned to their homes and to work after proper

diagnosis and treatment, which would be available in a chronic hospital. There are many who are receiving inadequate care at home and would benefit by care in a chronic hospital. In other instances removal of the chronic patients from the home would release members of the household who need to work to contribute to the support of the family.

On the whole, there seemed to be clear indication of the need for a city hospital in Cleveland exclusively for chronic patients.

These findings will be of interest as useful preliminary material on a subject which is to receive much attention and study throughout the country in the near future.—An Analysis and Classification of Cleveland Chronics, *Nation's Health*, IX, 11 (Nov.), 1927.

K. E. P.

Tuberculosis in Children—A sound and concrete article on "Tuberculosis in Children" by Dr. J. A. Myers, Director of the Lymanhurst School in Minneapolis, appears in the December issue of the *American Journal of Nursing*. The clear-cut discussion of diagnosis, treatment, and prevention should appeal to every public health nurse, whether or not she is doing specialized tuberculosis nursing.

Diagnosis in children requires great patience and understanding, says Dr. Myers. It begins with:

History—of previous illnesses, of the nature and quality of the child's food, of his physical activities and attitude toward play, and of his growth.

Examination is the next step. This includes: The tuberculin test, which must be understandingly interpreted; microscopic examination of discharges; physical examination, with emphasis on the lymph nodes and joints, and X-ray of chest and other suspected parts.

Treatment in childhood is more hopeful than at any other period in life, perhaps because tuberculosis in children is

apt to be a disease of the lymph nodes, which are in themselves protective mechanisms.

Conservation of energy is one of the first requisites in treatment. The child should be under medical and nursing supervision, that activities may be carefully regulated. Food of the right kind and amount is essential; a good deal of food is usually advisable. Good ventilation—air baths and heliotherapy—are also important factors in treatment.

Prevention is, of course, all-important. Unreported cases must be watched for. Known cases must learn how to protect others and be led to accept responsibility for doing so. Food must be uncontaminated; milk should be pasteurized. Children should be taught personal hygiene, and thoroughly understand how to keep themselves efficient and strong.

In conjunction with this discussion, it is interesting to refer to the article on Standards for Tuberculosis Work in a Generalized Nursing Program, an outline of East Harlem findings, published in *The Public Health Nurse* of November, 1926 (XVIII, 11:578).—J. A. Myers, M. D., Tuberculosis in Children, *Am. J. Nurs.*, XXVII, 12:1038 (Dec.), 1927.

L. A. D.

The Public Health Nurse in the Control of Communicable Diseases—The public health nurse holds a strategic position in the prevention of communicable disease. Her access to homes gives her an opportunity of discovering sources of information which might not otherwise be known. Although she is not able to make diagnoses, she should refer to the health officer at once persons whom she considers suspicious of having reportable diseases. As different communities may have slightly different procedures and beliefs in regard to the use of vaccines and sera, exclusion from school, quarantine, etc., it is necessary that she be

advised by the local health officer as to the practices in her community.

Some diseases are entirely preventable, such as diphtheria, smallpox, and typhoid. The attention of research workers is directed to others in the hope of also finding the means of completely controlling these. As example is the best teacher, the nurse should be protected from diseases where protection is available. Dr. Sayer also advises that she be Dick tested and immunized if found to be susceptible to scarlet fever.

Toxin-antitoxin and antitoxin are the weapons against diphtheria, each powerful in its place; antitoxin to give relief where cases exist or to protect exposed persons from the disease; toxin-antitoxin when there is time enough to allow protection to develop. All children who have received toxin-antitoxin may not be immune and, therefore, it is necessary to have the Schick test given to make sure protection is established.

Vaccination against smallpox will give absolute protection for several years. Where cases of the disease exist, the nurse can be of use in helping to trace all possible contacts and checking up on their vaccination.

The best defense against typhoid is immunization by means of typhoid vaccine. Persons who have had typhoid should also be watched to determine carriers and to make sure that no carrier is a food handler.

As the use of serum in the treatment of scarlet fever is still unstandardized, the nurse should know how the health officer regards the use of this. The scarlet fever serum may be compared to

antitoxin as the means of lessening the severity of scarlet fever (but not the length of the quarantine period). The Dick test is comparable to the Schick test. In scarlet fever, toxin is useful in epidemics as immunization develops rapidly. Immunization may cause severe local and general reactions.

Doctors vary widely in their opinions regarding the use of vaccine as a treatment or as a prophylactic in cases of whooping cough. Here, again, the nurse must be wary in advising the use of vaccine and should be guided by the opinion of the health officer.

In cases of measles, it is the special work of the nurse to prevent the disease among infants and small children, the group in which the mortality is greatest. The doctor or health officer is the only one who should suggest the use of convalescent serum.

Nurses may frequently be asked what should be done in cases of dog bite. The wound should always be cauterized by fuming nitric acid. Anti-rabic serum can be given by the attending physician. The head of the dog should be sent to the state laboratory for examination or the dog kept under restraint.—Stanley Sayer, M. D., *Pub. Health Nurse*, XX, 1:4 (Jan.), 1928. B. J. B.

Department of Nursing, Medical College of Virginia—To the graduate nurses of Virginia belongs the credit of presenting a foundation for the Chair of Nursing to the Medical College of Virginia in Richmond, which will be known as the Sadie Heath Cabaniss Department of Nursing.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

Equipping a Campaign—A picture of extensive and varied equipment required for a successful publicity campaign is provided in the catalogue of the 1928 Christmas Seal Sale supplies now being distributed by the National Tuberculosis Association. In addition to campaign manuals and press material the following are offered: posters (11 by 14, 3 styles; 19 by 26; 24 sheet); shop early cards; easel cutouts; poster snipes (2½ by 19; 3 by 28); letterheads; team workers' envelopes; booth envelopes; envelope stuffers (3 styles); follow-up cards; prospect cards (3 styles); personal solicitation cards; lantern slides (2 styles); motion picture trailer (150 feet; 15 feet); stories for children; talking points; self service coin box; bangle pins; buttons (2 styles); head dress; arm bands; electrotypes of Christmas Seals (4 styles); electrotypes for follow-up cards; electrotypes of double-barred cross; electrotypes of envelope stuffer.

When Is a Report a Report?—That an annual report is merely a historical document when it appears six months after the year ends is the contention of C. E. Ridley, National Institute of Public Administration. Under the heading "Promptness" in a study of 12 "typical current municipal reports" Mr. Ridley says: "Only two of the twelve reports were available for distribution within six weeks of the end of the period covered. Five of the twelve reports were not available until six months or more had elapsed. In this rating no credit

whatever is given for a report six months or more late, for it is contended that by that time it has lost all of its news value and therefore its usefulness depends alone upon whatever function it may serve as a means of recording financial statistics and historical events—purposes hardly justified in a report to the taxpayers on the current operation of their municipal government." The 20 points for judging the reports include: Promptness, Size, Important facts, Attractiveness, Diagrams and Charts, Table of Contents, Organization Chart, Recommendations and Accomplishment, Comparative Data, Propaganda. "Propaganda" would better be "Personal Publicity" (photographs of officials, etc.) for the entire report is "propaganda."—*Appraising Public Reports. National Municipal Review*, 261 Broadway, New York, N. Y. March, 1928. 50 cents.

Diphtheria Dramatized—"Delivered with a rush to the speakers' table by a bellhop this telegram introduced a special session of our Conference of State and Local Committees on Tuberculosis and Public Health, State Charities Aid Association of New York:

A murderer of little children is loose in New York State and we believe this killer is now at the Hotel Roosevelt. Won't your health conference find a way to help us?

The Children of New York State.

"The chairman, after solemnly reading the telegram, asked the audience what was to be done. A voice from the rear of the room declared, 'Let's catch this murderer and hold a court to try him.' The suggestion was unanimously accepted by the group, a bailiff and a sheriff were appointed, the door at the rear of the room opened at once and a

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

judge in black robes entered followed by the sheriff who dragged a figure garbed in black with a red mask who was labeled 'Black Diph.' The bailiff called the court to order in a loud voice, ordering all to stand and take off their hats. The judge proceeded solemnly to the bench, rapped for order and the 'trial' began.

"This unique introduction opened the special session on diphtheria prevention. The murderer was accused of slaying 264 children during 1927 in New York State, outside of New York City, and of maiming nearly 4,000 others. The prosecuting attorney was out for blood and called on a series of imposing witnesses to convict the murderer before the Court.

"These witnesses brought out the essential facts about the nature of diphtheria, its prevalence in the state, the principal points about diphtheria prevention campaigns, all conducted in regular Court procedure, with variations. It served to catch the attention of the group and to hold it for over an hour. The Judge in his charge to the Jury summed up the evidence and recommended a verdict banishing the murderer from the state.

"The stunt worked so well at this meeting and required so few properties and time to work it up, that it appears to be well adapted for use locally not only to call attention to diphtheria but to tuberculosis. It could be used to advantage in the organization meeting for a diphtheria prevention campaign, or early diagnosis project.

"What do you think of it?"—Robert W. Osborn, S.C.A.A.

A State Diphtheria Poster Contest

—A poster contest for students in the recognized school art departments in New York outside of New York City is being conducted by the State Department of Education in collaboration with the New York group of state agencies combating diphtheria, and with the co-operation of the National Poster Art

Alliance. The highest prize will be an art scholarship amounting to \$365. The contest runs from February 15 to May 15. The plan as a whole offers practical suggestions for contests in other states. The statement of the diphtheria problem addressed to the students is well done, and the suggestions to the students with the contest rules could be adapted elsewhere. For copies address Marie F. Kirwin, State Committee on Tuberculosis and Public Health, S. C. A. A., 105 East 22d Street, New York, N. Y.

Using Words That Other Folks Use—A staff worker was recently making school inspection in a small town which she had visited some months previously. She asked of a small person undergoing inspection, "And how is your sister?" "Oh she's pretty well, but she has tuberculosis."

"She has tuberculosis?" Why when did you learn that?"

"You said so!"

The records were looked up. The inspector breathed a sigh of understanding when she discovered that the girl had been sent home because of pediculosis, or what ordinary folk call lice.—Reported in *Michigan Out-of-Doors*, Lansing, Mich.

Do We Know? Or Do We Think We Know?—What does the "average" man do in a museum or in an exhibition?—

He wanders aimlessly, yes, but not blindly. His attention is drawn to this and distracted from that. He must have glimmering interests which might be fanned into overt enjoyment. Yet, this casual visitor is in the main a mystery and, if he is to be dealt with effectively, there needs be added to the talking about him and thinking about him deliberate observation of his behavior.

That deliberate observation of his public can be of service to the museum administrator (or the organizer of exhibits—Editor) should not be a novel idea. If there is any single predominant achievement of the psychology of the past quarter-century it lies in the revelation that so far as human nature is concerned acquaintance with is often a far cry from

knowledge about. . . . Most of us felt quite well acquainted with American intelligence before the scientific scrutiny of that capacity in the white draft. And we were acquainted with that intelligence—we were even able to get on with it moderately well—but the deliberate inventory taken by the testers revealed unsuspected facts. Similarly in the present case, there is no reason to believe that the museum director is not acquainted with the casual visitors who wanders through his precincts. Yet, only a few hardy souls would claim that deliberate observation can add nothing to what has been learned informally and passively.

. . . . At the time our studies of the museum visitor were beginning, the Associated Press quietly announced what was under way. Immediately the letter writers and the editorial writers began to volunteer to solve our problems, not by doing our observing for us, but by replacing observation with argument. . . . We wanted to find out as accurately as possible what is actually going on in the museum. And we saw no other way of getting such information than by going after it directly and deliberately.—

In "The Behavior of the Museum Visitor," by Robinson, Sherman and Curry. American Association of Museums, Washington, D. C. 1928. 78 pages. \$.75.

This preliminary report is based on the first two years' work on a study financed by the Carnegie Corporation. It considers museum "fatigue"; the effect of size, position and context upon the individual picture; and guidance by pamphlets. The study suggests application to health exhibitions, and is a reminder of the need of scientific study of human behavior under the impact of various forms of education. Not until such studies are made can we know where we are at in our lavish expenditures of time and money on public health.

"Health Promotion Week"—In Illinois the week is scheduled for two periods: April 1-7 in the 52 counties to the south, and April 22-28 in the 50 northern counties. The week will include the following: Health Sunday, Dental Hygiene Day, Dental Examination Day,

Food Facts Day, Diphtheria Prevention Day, School Health Day, Heart Disease and Cancer Prevention Day.

The "program suggestions" for the series of days are simple, practicable interpretations of the themes as they should be presented by local committees. The concreteness of the topics for the days is a happy contrast to the plan for many health weeks. Unfortunately, this concreteness is partly nullified by the diversity of topics represented in the "educational services and material available" through the state department. Many local committees are likely to distribute printed matter unrelated to the topic of the day. The full program and other material appears in *Illinois Health News*, State Department of Public Health, Springfield, Feb., 1928. *Free*.

Can It Be Instructive?—A state department of health offers in its lists of motion pictures "a one reel combination of four subjects presented in animated cartoon form. It deals with diphtheria, prenatal care, infant feeding and the house fly. Very entertaining and instructive for any type of audience." Probably the "combination" picture is entertaining, but can it be instructive? Can "any type of audience be *instructed* in one session on so many diverse subjects?" Of course, if not too "entertaining" the picture may convince almost "any type of audience" that something or other "will get them if they don't watch out!"

Publicity and Education at Memphis, May 2-9—Five morning sessions and 8 afternoon and dinner sessions, plus several informal luncheon gatherings make up the program of the Committee on Publicity Methods and the Educational Publicity Division of the National Conference of Social Work meeting at Memphis. Among the topics will be: Making Up the Year's Program in Publicity (national, large city, small town), Interviews with secretaries of large

givers on how publicity and appeal letters look to them, Outstanding Publicity Ideas of the Year (including, we hope, some diphtheria and other health features), To Sob or Not to Sob—Trial of the Sob Sister, Letter Clinic, Integrity in Publicity—facts and ethics, The Use of the Welfare Appeal in Commercial Advertising, Where the Publicity Worker Gets His Point of View and Technic, The Use of Demographic Areas in Publicity. Zona Gale will discuss Literary Values in Social Work. For program address Committee on Publicity Methods, 130 East 22d St., New York. Health workers will be welcome. Awards will be made for “unusual achievements in publicity”—newspapers, letters, printed matter. For conditions write the Committee. The exhibits will include much that is new and helpful, and the headquarters will have opportunities for meeting specialists.

COÖPERATING GROUPS

A health program for parent-teacher associations appears in Parent-Teacher Handbook for North Carolina. University of N. C. Press, Chapel Hill, N. C. 50 cents.

The American Junior Red Cross is 10 years old. What it has done and is doing is told in *Red Cross Courier*, Washington, D. C., Oct. 1, 1927. *Free*.

A School Health Appraisal Form, 8 pages, was distributed in September, 1927, by the Iowa State Department of Health to the Parent-Teacher Association of the state. In addition to sending copies of the filled-in form to the State Department of Health, every association was urged to discuss the findings in a November or December meeting.

Condensed information and sources of information about organizations—boys and girls, physical education, etc., are given in Sources of Information on Play and Recreation, by M. P. Williams. Russell Sage Foundation, 130 East 22d

St., New York, N. Y. Revised 1927. \$1.00. With references to material on recreational occupations for camps and institutions.

POPULAR HEALTH ARTICLES

“The Cause of Modern Baldness.” *Literary Digest*. Feb. 4, 1928.

“The Dark Arrows of Phoebus,” by Frank Thone. *High School Service*, American Red Cross, Feb., 1928. 15 cents. The sun, vitamin D, and rickets.

“Uncle Sam Fitter Than Ever.” *Literary Digest*. Feb. 4, 1928. “1927 was the healthiest year.”

“Newspaper Recruiting of Students,” by Mary Goodyear Earle. *Trained Nurse*, New York. Jan., 1928. One of a series of vocational talks on the professions open to women in the *Herald-Tribune*, New York, N. Y.

EDUCATIONAL MATERIAL

One of the best diphtheria folders I have seen was issued by the Cleveland Health Council, 510 Electric Bldg., Cleveland, O. The most difficult words used are explained thus: “immune (cannot get the disease)” and “sus-cep-table (liable to take the disease).” Good size type and well-printed. Ask for a copy.

Another diphtheria folder rather good in its approach to the reader comes from the Wisconsin State Board of Health. But it has many “hard words,” and probably gives more information than is necessary.

Mothers Will Gossip says some “Gossip like this means trouble and sometimes Death!” such as, “Give him something to eat when he cries,” etc.; and “Gossip like this means intelligent help that develops fine healthy babies,” such as, “My baby was a skeleton until the Health Station taught me about his feeding.” Four baby foot-prints, a striking cover design, show before and after care of fallen arches.—Children’s Health Service, 578 Madison Ave., New York, N. Y.

LAW AND LEGISLATION

JAMES A. TOBEY, LL.B., DR.P.H.

Traveling Expenses and Income Taxes—Whether members of the American Public Health Association who pay their own expenses in order to attend the Annual Meeting and other professional meetings can deduct these expenses in computing their federal income taxes is now uncertain. In 1922 the U. S. Bureau of Internal Revenue ruled that physicians could not do so, but later the Board of Tax Appeals allowed such a deduction by a chemist who attended a meeting of a national chemical society. The Bureau of Internal Revenue has apparently never given a definite ruling applicable to members of the A. P. H. A., though in a recent letter to the associate editor, the bureau states that such deductions are not allowable.

In order to remedy this unsatisfactory situation, Senator Arthur R. Robinson of Indiana has introduced an amendment to H. R. 1, the Revenue Act of 1928. On page 19 of this measure one of the allowable deductions is for "traveling expenses (including the entire amount expended for meals and lodging) while away from home in the pursuit of a trade or business." Senator Robinson's amendment would add to this section the following: "or in attending meetings of trades or business organizations of which the taxpayer is a member." If this amendment is adopted, there would apparently be no question about these deductions, as they would have the sanction of law and the whims and vagaries of a bureau would no longer govern in the matter.

Federal Farms for Drug Addicts—Back in 1854, Dorothea Dix got a bill

through Congress to set aside 10 million acres of public lands for the care of the insane. The measure was vetoed by President Pierce. A somewhat similar, though less lavish, project for the treatment of drug addicts has now been proposed by Representative Porter. His bill, H. R. 11192, calls for two federal narcotic farms to treat the drug addicts confined in federal penitentiaries. The proposed farms would care for 3000 prisoners. Among many other provisions, the Surgeon General of the U. S. Public Health Service would be required to examine each addict one month prior to his discharge in order to determine whether he had been cured.

Proposed Definition for Oleomargarine—Federal statutes now set forth the different fats and oils used in making oleomargarine and provide that these products are "oleomargarine" if made "in imitation or semblance of butter" or when so made are "calculated or intended to be sold as butter or for butter." According to Representative G. N. Haugen, who has introduced a bill, H. R. 10958, to amend the law, large amounts of fat compounds on the market are being sold without regard to the provisions of the law, as they are put up like butter in pound and even in parchment wrapped quarter pound packages, of a texture and containing moisture similar to that of butter. They also contain salt and some of them have artificial coloring matter, though labelled as "cooking compounds."

Careful research and tests on these products discloses, according to Mr. Haugen, that they do not contain milk or cream and were not mixed or churned

in milk or cream. The dairy and oleomargarine industries alike are stated to be of the opinion that these products are the potential subject of grave frauds. Mr. Haugen therefore proposes to add a third alternative to the definition of oleomargarine, as follows: "or (3) churned, emulsified, or mixed in cream, milk, water, or other liquid, and containing moisture in excess of 1 per centum." This, says Mr. Haugen, "makes a clear, plain, and honest definition, fats sold as fats left alone, fats made to imitate butter all put under the oleo law." A similar bill, S. 3247, has been introduced in the Senate by Senator Norbeck.

Oleomargarine colored in any manner would be subject to a tax of 10 cents a pound, according to an amendment to the Oleomargarine Act of 1886, introduced by Representative Linthicum as H. R. 11848. Mr. Linthicum is quoted as saying that the present law has been circumvented by the discovery of a yellow fat in old cattle which produces a yellow oil and when mixed with oleomargarine makes it look like butter.

Health of the Indians—Stating as one of the whereases that it is claimed that preventable diseases are widespread among the Indian population, that the death rate among them is not only unreasonably high but is increasing, and that the Indians in many localities are becoming pauperized, the Senate on February 2, 1928, adopted a resolution for an investigation of Indian affairs. The expenses, up to \$30,000, are to be paid out of the contingent fund of the Senate.

Contact with the superior civilization of the white man has reduced the number of North American Indians from approximately 1,153,000 pure blooded aborigines to about 406,000, with a high percentage of mixed blood, according to a recent announcement of the Bureau of American Ethnology of the Smith-

sonian Institution. A series of great smallpox epidemics, beginning in 1637, seems to have been the greatest single factor, though war and fire water and other diversions and dissipations of the white race have also played their part.

Other Federal Legislation—A monument to the memory of Major General William Crawford Gorgas in the City of Washington is proposed in a joint resolution, S. J. Res. 92, introduced by the ebullient Senator Tom Heflin of Alabama. The President's physician is as far as ever from getting the rank of colonel, for Messrs. Blanton and two other earnest opponents objected in unison when the bill, H. R. 5658, for this purpose came up in the House on February 6, 1928. A most comprehensive bill, H. R. 10798, to regulate the practice of the healing art in the District of Columbia has been introduced in the House. Hearings on the bill, H. R. 5604, for more hospitals for veterans were concluded on February 4, 1928.

Damages for Typhoid—A claim for \$5000 for damages and \$1000 for expenses has been filed against the city of Cohoes, N. Y., by the father of a girl who contracted typhoid fever, according to *Health News* of New York for February 6, 1928. If the claims were not allowed, the father planned to bring action in court.

This case of typhoid is alleged to have been contracted from water supplied by the city to the home of the girl. The city is called grossly negligent in permitting polluted water from a canal to enter the city's mains through a cross-connection at an industrial plant. This is a violation of the State Sanitary Code. Forty-eight cases of typhoid fever were reported from the general vicinity of this cross-connection.

Court decisions in 8 states have determined that corporations, whether private or municipal, are liable for damages

for injuries or deaths due to typhoid fever caused by polluted water supplied by the corporation to individuals. Since 1910, considerably more than \$50,000 in damages has been allowed by courts and many times that amount unquestionably has been paid in settlements out of court. A comprehensive article entitled, "The Liability for Water-Borne Typhoid," is scheduled for publication in the April issue of *Public Works*.

Milk Ordinance Upheld—Under its police power a city may require producers of milk sold in the city to comply with certain reasonable requirements, even though the dairies are outside the city limits. It is also proper to compel these producers to secure a license, and power may be delegated to the health officer to make inspections for this purpose. These and other important points were decided by the Supreme Court of Oregon in a recent leading case, *Korth v. City of Portland*, 261 Pac. 895.

The facts were that Korth and another dairyman brought suit to restrain the enforcement by the city of a comprehensive milk ordinance, which set forth the requirements for pure milk, provided for licensing dealers, and gave to the health officer the duty of making inspections. These dissident dairymen produced their milk outside the city limits on farms which they admitted did not comply with the requirements, and they sold it in Portland, though having no licenses.

The court held in the first place that the city could regulate the sale of milk within the city and thus the ordinance was not extraterritorial in scope. Although a state law prohibits a city from requiring licenses of peddlers of farm products produced from the soil, the court held in this case that the licenses were merely to cover the expenses of inspection and that such license fee is not levied for peddling. "It is a reasonable provision for the proper inspection and

regulation of the sale of milk within the city. Those who are selling milk are required to register and pay a license, not because they are selling as peddlers, but to insure the proper regulation for the protection of the inhabitants of the city."

The contention that the power conferred on the health officer would allow him to base his requirements on personal whims and caprices was also dismissed by the court as untenable. The Legislature cannot delegate power to make a law, but it can make a law to delegate a power to determine facts upon which the operation of the law depends.

Good Advice from Indiana—A statement worth framing and hanging on the walls of the office of the health department occurs at the beginning of the red covered book of instruction to health authorities issued by the Indiana State Board of Health, of which Dr. W. F. King is secretary. This book contains the public health laws and regulations of the state. The good advice is as follows:

Study the health laws and the health rules. Become familiar with your duties and powers. Don't hesitate or be timid about enforcing the health laws and rules for fear of making enemies. The honest, straightforward officer who enforces law will be respected and honored. If you permit a man to continue to violate the law which it is your duty to enforce, he will despise and ridicule you.

Medical Legislation of 1927—Fifty bills affecting medical licensure and the practice of the healing arts were introduced last year in the various state legislatures, according to a summary in the annual report for the year 1927 of the American Association for Medical Progress, Inc., of New York City. In the 44 state legislatures in session, various efforts were made to obstruct research and to undermine legal standards for medical practice. Attempts to prevent the use of dogs or other animals in medi-

cal research, made last year in New York, Maryland and Minnesota, were killed in committee. Efforts to change vaccination requirements in Massachusetts and New York also failed. Organized local efforts to have children immunized against diphtheria were met in some places with alarming stories of the disasters supposed to have resulted from the use of toxin-antitoxin. These attacks were successfully dealt with by local health officials who supplied the public with the facts.

Bills requiring that applicants for licenses to practice the medical arts be examined in the basic sciences were passed in Nebraska, Minnesota and Washington, though they were defeated in Colorado, Kansas and Oregon.

Miscellaneous—Nearly 20,000,000 cattle were under supervision and over 4,000,000 were on the waiting list for testing on January 1, 1928, in connec-

tion with the coöperative tuberculosis eradication work of the U. S. Department of Agriculture. During December, 1927, there were tested 935,984 cattle, and 18,966 reactors were found.

Present methods and administration of Federal Food Law enforcement are described by W. G. Campbell in the *American Food Journal*, January, 1928.

Rules for packing and labeling of edible oils were issued by the Federal Trade Commission on January 31, 1928.

A national electrical safety code has been issued as *Handbook No. 3* by the U. S. Bureau of the Standards.

A comfort station is not a nuisance *per se* and may or may not be such in fact according to circumstances. This is the holding in *Zey v. Town of Long Beach*, 258 Pac. 492.

The Iowa Supreme Court has held a town liable for polluting a stream. *Stovern v. Town of Calmar*, 216 N. W. 112. This is settled law.

CONFERENCES

April 12-14, American Society of Biological Chemists, Inc., Ann Arbor, Mich.

April 12-14, Federation of American Societies for Experimental Biology, Ann Arbor, Mich.

April 28, National Research Council, Washington, D. C.

April 30-May 2, American Pediatric Society, Washington, D. C.

April 30-May 2, National Probation Association, Memphis, Tenn.

April 30-May 5, National Congress of Parents and Teachers, Cleveland, O.

May 1-2, American Association of Pathologists and Bacteriologists, Washington, D. C.

May 2-9, American Association for Organizing Family Social Work, Memphis, Tenn.

May 10-12, American Association of Hospital Workers, Memphis, Tenn.

May 23, American Climatological and Clinical Association, Washington, D. C.

May 23-26, American Physical Education Association, Baltimore, Md.

May 28-June 2, American Library Association, West Baden, Ind.

May 28-June 7, General Federation of Women's Clubs, San Antonio, Tex.

June 4-9, Biennial Nurses Convention, Louisville, Ky. (American Nurses Association, National League of Nursing Education, National Organization for Public Health Nursing)

July 8-12, Congrès International de la Protection l'Enfance, Paris, France.

July 8-13, First World Congress of Social Workers, Paris, France.

July 16-21, Thirty-ninth Congress Royal Sanitary Institute, Plymouth, England.

October 15-19, American Public Health Association, Chicago, Ill.

BOOKS AND REPORTS

USEFUL BOOKS OF THE PAST YEAR

M. P. RAVENEL, M.D.

OF THE making of books there is no end." During the past year there has been a great flood of books, bearing more or less directly on the teaching of public health. For the benefit of those who are trying to keep up with the advances in public health, we are making an attempt to note briefly the most important books published or reviewed during the past year. Most of these have been selected from the notices in our own JOURNAL, though a number of other leading journals have been consulted freely. We have avoided

mentioning new editions, only one exception having been made.

Specialism has reached even into public health, so the books are grouped loosely into classes. Strict classification is impossible in many cases. Practically all books on hygiene properly give more or less attention to anatomy and physiology, but authors vary in this respect.

Among those in which the body and its functions are primarily considered, to be mentioned *The Human Body*, by Quinor Heaton, E. P. Dutton & Co.; *Anatomical Chest of the Adult and the Child*, by J. A. Myers, Williams and W. Norrell; and *The Human Body*, by Marshall Jones, G. P. Putnam's Sons, and *The Human Body*, by Logan Clendenen, Alfred A. Knopf, Incorporated.

dening, Alfred A. Knopf, Incorporated.

In these days when athletics, especially the intercollegiate form, have become so unduly emphasized, the book, *Heart and Athletics*, by Deutsch and Kauf, translated by Louis M. Warfield,

C. V. Mosby & Co., is very timely.

Biographies are always interesting, and no student should miss the opportunity of studying the careers of those who have helped to make science what it is. The following books deserve especial mention: *Life and Work of Sir Patrick Manson*, by

Philip H. Manson-Barr and A. Alcock, Wm. Wood & Co.; *Lister As I Knew Him*, by John Rudd Leeson, Wm. Wood & Co.; and *Interpreters of Nature*, by Sir George Newman, Oxford University Press. The one by Sir George Newman contains a number of sketches, biographical and historical, written in an especially interesting style.

The relation of the lower forms of life to disease is constantly attracting more attention. Three books may be mentioned in this connection: *The Biology of the Protozoa*, by Gary N. Calkins, Lea & Febiger; *Host-Parasite Relations Between Man and His Intestinal Protozoa*, by Robert Hegner, Century Co.; and *Protozoology*, by C. M. Wen-

FOR those who have not the time to read their way through mountains of books, even on public health subjects, this bird's-eye view of some of the peaks will serve as a welcome guide. It should not be considered as a detailed chart—not every good book could be mentioned even briefly. However, to help in selection, something good is listed in every major field covered by the public health compass.

yon, Wm. Wood & Co. The last mentioned book is encyclopedic, and its cost is prohibitive to the average man, but every library should have it.

Cancer Control—Report of Symposium at Lake Mohonk, contains material with which all should be familiar.

Carriers are always with us, and we can recommend *The Carrier Problem*, by K. C. Paul, Oxford University Press.

We have frequently commented with approval on the increasing recognition of the importance of oral hygiene. In this field we find: *Pyorrhoea Alveolaris*, by F. St. J. Steadman, C. V. Mosby Co.; *Diseases of the Mouth*, by Sterling V. Mead, C. V. Mosby Co.; and *Dental Education in the United States and Canada*, Carnegie Foundation.

Need for Eugenic Reform, by Leonard Darwin, D. Appleton & Co. is easily the best book which has recently appeared on this important subject.

History is represented by *Peaks of Medical History*, by Charles L. Dana. Paul B. Hoeber, Inc.; and *Introduction to the History of Science*, by George Sarton, Williams & Wilkins Co. The latter is an encyclopedic source book, running from the time of Homer to that of Omar Khayyam.

Professor E. O. Jordan has given us an excellent work, *Epidemic Influenza*, published by the American Medical Association Press, which is a digest of all obtainable literature dealing with the etiology and epidemiology of this disease, which apparently has come to stay with us. In the recent past it has caused the greatest number of deaths throughout the world of any diseases known in history, with the exception of plague.

Several laboratory manuals have appeared, most of which are good, but the large volume, *Standard Methods*, by A. B. Wadsworth, Williams & Wilkins Co., is outstanding. This gives detailed descriptions of the methods in vogue at the New York State Laboratory, of which the author is director.

Hygiene is an all-embracing term, though several clear divisions are recognized. The book *Hygiene*, by Florence Lyndon Meredith, P. Blakiston's Sons, approaches the subject from a number of different standpoints, and is offered as a textbook for students with limited scientific background.

Industrial hygiene, which is assuming a proper place in our program, is well represented by *Personal Health*, by E. R. Hayhurst, McGraw-Hill Book Co.; *Advising the Tuberculous About Employment*, by Hamilton and Kidner, Williams & Wilkins Co.; and *Medical Care of Industrial Workers*, National Industrial Conference Board. For school hygiene, another most important division, we can recommend especially *Fundamentals of School Health*, by James Kerr, MacMillan & Co., which in our judgment, is easily the best single volume that has been written on the subject, and is encyclopedic in character.

Other excellent books are *Health Behavior*, by Wood and Rowell, Public School Publishing Co.; and *Health Supervision and Medical Inspection of Schools*, by Wood and Rowell, W. B. Saunders & Co. Deserving particular mention is the *Handbook on Positive Health*, by several authors, edited by Lenna L. Meanes, Women's Foundation For Health, New York, N. Y. This is a book on personal hygiene, designed especially for women. *Hygiene and Sanitation*, by Jesse Feiring Williams, W. B. Saunders & Co., is an excellent presentation of the subject. An outstanding book in this division is *International Hygiene*, by C. W. Hutt, Methuen & Co., which speaks in international terms, and gives the average reader an entirely new view of the subject. Mental hygiene, a subject which the average health officer and physician have left too much to the specialist, is well represented by *Everyday Problems of the Everyday Child*, by Douglas A. Thom, D. Appleton & Co.

Two excellent books on nutrition, another subject of surpassing importance which is now attracting general attention, are *Your Weight and How to Control It*, edited by Morris Fishbein, G. H. Doran & Co.; and *The Foundation of Nutrition*, by Mary Swartz Rose, MacMillan & Co.

Vaccination against smallpox is considered in an historical scientific survey of the question called *Should We Be Vaccinated?* by Bernhard J. Stern, Harper & Bros., which should convince anyone of the value of the procedure.

The matter of sewage disposal is inseparably connected with the purity of drinking water. A new volume, *Solving Sewage Problems*, by Fuller and McClintock, McGraw-Hill Book Co., is excellent. A second book on this subject, more suitable for the engineer than for the average reader is *The Activated Sludge Process*, by Arthur J. Martin, McDonald & Evans, London.

Two books on the subject of water and its purification are *The Microscopy of Drinking Water*, by George Chandler Whipple, John Wiley & Sons; and *Studies of the Efficiency of Water Purification Processes*, by H. W. Streeter, U. S. Public Health Service. The former of these is a new edition, and is mentioned here because the author is no longer living, and the present volume, edited by his son and others, contains much new material.

While not strictly relating to public health, as such, two books on tuberculosis should be mentioned: *Getting Well and Staying Well*, by John Potts, C. V. Mosby Co.; and *Tuberculosis: Bacteriology, Pathology and Laboratory Diagnosis*, by Baldwin, Petroff and Gardner, Lea & Febiger. The latter is the result of years of experience at Saranac Lake and gives new methods due to Petroff.

It has frequently been pointed out that if we could apply what we already know, life could be made happier and

greatly lengthened. The American Public Health Association has for several years past given much attention to the administrative aspect of public health, and as the result, can now offer *Community Health Organization*, edited by Ira V. Hiscock, which contains revised plans for communities of 100,000 and 50,000 inhabitants, and a new plan for cities of 30,000. Closely allied to this subject are *City Health Administration*, by Carl E. McCombs, MacMillan & Co.; *Municipal and Rural Sanitation*, by Ehlers & Steel, McGraw-Hill Book Co.; and *Clinics, Hospitals and Health Centers*, by Michael M. Davis and others, Harper & Bros.

Some other useful books for general reading are: *Health Problems in Organized Society*, by Sir Arthur Newsholme, P. S. King & Co., London; *Problems of Social Well-Being*, by James H. S. Bossard, Harper & Bros.; and *American Medicine and the People's Health*, by H. H. Moore, D. Appleton & Co. The titles of these books give some idea of their contents. The last is written from the economic standpoint and is a comprehensive review of the cost of medical care and its relation to the public. It has had much to do with the appointment of a committee which is now making a study of this subject. A book which is especially suited to the laity is *Triumphs of Medicine*, by H. S. Hartzog, Doubleday, Page & Co., which tells in non-technical language many of the good things which scientific medicine has accomplished.

Most of our readers are aware of the numerous attempts which have been made for some years past to reorganize the departments of our government in Washington, there being, at present, upwards of forty bodies which deal more or less directly with medicine and public health. Two books give facts along this general line: *Federal Health Administration in the United States*, by Robert D. Leigh, Harper & Bros., and *National*

Government and Public Health, by J. A. Tobey, Johns Hopkins Press.

Advancement in medicine, curative as well as preventive, depends upon research, and since the anti-evolutionists and opponents of science generally are busy, we recommend for general reading, *The War on Modern Science*, by Maynard Shipley, Alfred A. Knopf.

We have made no attempt to include

See Announcement of New Books on pages XXVI-XL

The Human Body—By Logan Clendening, M.D. Illustrations by W. C. Shepard and Dale Beronius and from photographs. New York: Knopf, 1927. xxii + 399 pp., 102 figs. Price \$5.00

Medical information has often been regarded as the peculiar property of the physician, to be jealously guarded by a screen of classic verbiage and hidden under the camouflage of technicalities. Education in medical matters was to be gotten only along the arduous and closely guarded route of premedical, pre-clinical, clinical, and postgraduate years of intense and sustained study. However, the development of the modern sciences tributary to medicine and the advances in the arts of medicine and surgery have now attained such a unification and precision that a presentation primarily for the unprofessional but inquiring reader is both opportune and welcome.

Dr. Clendening's *The Human Body* meets this need. It is first and last an epitome on medical knowledge, with just enough anatomy and physiology to enable the reader to comprehend the normal body in health, whose disorders in disease and old age are the main theme of the work.

The treatment is refreshingly frank and not a few medical idols of confiding patients are tumbled off their pedestals. The natural powers and resources of the body, its own defensive mechanisms, its normal progress into the inevitable stages of senescence emerge ever and

books in foreign languages. Anyone interested will find a number of them reviewed in our columns, as well as in those of other journals. We believe that the majority of our readers are more interested in books using their mother tongue and feel sure that anyone who carefully reads those which have been mentioned will be fairly well posted on hygiene and public health.

again in the discussions of disease and its prevention or cure. It is not, however, intended as a first aid till the doctor comes or a compendium of diagnosis and home treatment, but rather as a background of information on the organ systems in health and in disease which will help the intelligent inquirer to cooperate more effectively with his physician—this in spite of the author's defense of lying to his patients about their true condition.

The discussions of inoculation and vaccination are peculiarly interesting to public health workers, especially the reproduction of the cartoon of 1802 exhibiting the dire results of "cow pock inoculation" in the form of bovine heads and horns growing out upon the terrified victims.

The author is wholly "sold to the idea" of the baneful and all but omnipotent effects of heredity—perhaps a deal more than even the geneticists themselves would admit, as for example with reference to the victim of baldness he says: "He may be sitting in chairs with snake oil and violet lamps playing all over his head, when the only way to cure his baldness would have been to castrate his grandfather."

Possibly the author's amply exhibited antipathy to all forms of social control—except in the matter of vaccination—is back of his rather unguarded statements about syphilis, which he says "has a very hard name—a much worse one than it deserves. It is, after

all, not such a very dreadful disease." He then proceeds to enumerate its disastrous effects, and concludes with the only prescription in the book!

The illustrations are new and they really illustrate in an illuminating fashion. They are often diagrammatic and very clear with the accent on the important features. Those of historical incidents are particularly well chosen and well conceived.

The fact that the author at times lapses into characteristic Baltimorean Menckenes, especially when he recalls Volstead and vies with Schopenhauer in his view on marriage and its dire consequences may charm some of his readers—but not all of them, for he will have many. In spite of these distractions, the main theme is diseases exposed to public view and its story dramatized, possibly even over-emphasized at times, but always quite readable and informing.

CHARLES A. KOFOID

Modern Methods of Testing Milk and Milk Products—By *Lucius L. Van Slyke*. (3rd ed.) *New York: Orange Judd Pub. Co. 1927. XII + 344 pp., 53 figs. Price, \$2.00.*

Earlier editions of this book issued in 1906 and 1912 have found a wide use and it seems probable that this completely revised new edition will prove equally useful. The title is somewhat misleading in that the common chemical and physical methods of examining milk are the only methods discussed in detail. After a chapter on the chemistry of milk and one on methods of sampling and of preserving samples for the fat test, five chapters are taken up with a discussion of the Babcock fat test in its various applications and a later chapter (XVI) returns to the same general theme. The Roesse-Gottlieb method is given as a means of checking the accuracy of the Babcock test.

Other chapters discuss methods of

determining water in butter and cheese, salt in butter, acidity in milk and milk products. Various simple biochemical tests and methods of testing milk by rennet extract and pepsin are taken up in the next two chapters, followed by a discussion of methods of determining specific gravity, total solids, casein and adulterations. The two chapters on methods of commercial testing, scoring and grading butter, cheese, milk, cream and ice cream are useful but show less familiarity with the latest developments, particularly in the field of grading market milk.

The final chapter giving examples in the arithmetic of milk and milk products helpful to practical workers is followed by an appendix which gives the specifications of standards for the glassware used in the Babcock test drawn up by the Association of Official Agricultural Chemists and the American Dairy Science Association. The United States Government definitions and standards of purity for milk and milk products are also included.

An interesting personal touch is given the book by a frontispiece showing Dr. Stephen M. Babcock, the originator of the fat test that bears his name, reading a fat test in his laboratory. Dr. Babcock's active life spans practically the whole of the experiment station movement in America as he began his work at the New York State Station at Geneva before the Federal Experiment Stations had been established in all of the states. Removing within a few years to the Wisconsin Station where he has since remained, his place was soon taken at the New York State Station by Dr. L. L. Van Slyke. Some of the tables given in this book are those prepared by Dr. Van Slyke in his early work with the Babcock test. These figures still remain the most accurate and comprehensive figures that have been secured for showing the fat present in the milk of various breeds of dairy animals.

R. S. BREED.

Food Infections and Food Intoxications—By *Samuel Reed Damon, A. M., Ph.D.* Baltimore: *Williams & Wilkins*, 1928. 266 pp. Price \$4.00.

This is a reference book which is addressed to food chemists, bacteriologists, physicians and nutrition experts and deals with cases in which food acts as the vehicle by which the infectious agent or toxic material is disseminated. A part only of that limited field is covered as the author narrows his discussion to those diseases in which the transmission of the infectious or toxic substance takes place, as a rule, only through the medium of food. This results in the exclusion of such matters, as for example the transmission of typhoid by shellfish.

In discussing each form of infection or intoxication, the author has presented in considerable detail the phases of etiology, symptomatology, diagnosis, treatment and prophylaxis.

In the introduction to the book there is a short dissertation on the discarded theory that ptomaines cause food poisoning. This might well have been amplified in view of the fact that so many otherwise well informed persons, including physicians and health officers, still persist in seriously giving "ptomain poisoning" as a cause of sickness and death.

The book is divided into three parts. Part I contains chapters on para-typhoid infections from food, tuberculosis from milk and meat, undulant fever from milk, septic sore throat from milk, and actinomycosis. Part II contains chapters on botulism, mushroom poisoning, grain intoxications, milk sickness, potato poisoning, and fish and shellfish poisoning. Part I deals with the ingestion of microorganisms capable of elaborating toxins within the human or animal body. Part II deals with the ingestion of pre-formed toxins.

While the text is well worded, interesting, and easily read and while the discussions of symptomatology and diag-

nosis are, in particular, ably presented, Parts I and II, on the whole, leave a distinct sense of incompleteness. This is not entirely due to the limitations which the author deliberately adopted. Another reason will be sensed from the fact that of 326 references to literature, there are none to work published in 1927, and only 2 and 3 respectively to work published in 1926 and 1925. The chapter on undulant fever is lamentably out of date and presumably was so even before it was printed. It is based on goat's milk, and leaves untouched the highly important matter of cow's milk. A small, but by no means negligible, part of the material in the book appears to be vague and inconclusive, as for example, the evidence presented to support the section on "Poisoning from fish containing a poisonous principle of bacterial origin."

Part III, regarding Zoo-Parasitic Infections acquired through Food, contains chapters on human infection with animal parasites, trichinosis, taeniasis, other parasites of man acquired through food, and diagnosis of helminth infestation, and was written chiefly by Norman R. Stoll, as appears in a rather inconspicuous footnote. This part of the book is distinctly up to date. Of 89 references which it makes to published literature, 1 is for 1927 while 14 and 7 respectively refer to articles which appeared in 1926 and 1925. It contains material of interest and value which, being in such a specialized field, might not otherwise be located by many readers. It is concise, well written and distinctly worth while, even though much of the material may be considered to be chiefly of academic interest in this country.

The proof reading of the book was not perfect by any means. Five typographical errors were noted, of which one, on page 255, naming a specific gravity of 1:200 might be confusing to some readers. The print is clear, the illustrations generally good and the binding is strong.

H. W. REDFIELD

International Hygiene—By C. W. Hutt, M.D., D.P.H. London: Methuen & Co. Ltd., 1927. 261 pp. Price \$3.00.

The author has given us a book entirely unlike most works on hygiene, and one of unusual value. It is true that he writes largely from the standpoint of a comparatively small island country, which is dependent to a great extent upon other parts of the world for its food supply. On account of the enormous shipping interests of England, maritime quarantine perhaps plays a larger part in the protection of that country than of any other, though it is everywhere an important factor. In America it is now entirely under the U. S. Public Health Service, but only a few years ago certain ports and states maintained their own quarantine.

The chapter on International Sanitary Conventions would be interesting under any circumstances, but its significance has been tremendously increased by the introduction of steam vessels and the airplane.

Another question of great international importance is discussed in a chapter under Drug Habits, which gives a rational discussion of one of the most vexed questions with which the public health officer has to deal. Three topics of international interest are Emigration and Immigration, Venereal Disease, and the Health of Seamen, to each of which a chapter is devoted. Industrial Hygiene, as an international question, affects the people of this country chiefly in the importation of hides and fleeces.

About one-third of the book is given to Voluntary Aid, such as the Red Cross, in public health, and the Medical Work of the League of Nations, the latter of which takes into consideration also the Office International located in Paris, and its predecessor, which rendered such valuable assistance to many nations.

The author has given us a volume of great value which should teach us to think of health internationally. The

make-up of the book is excellent and it is written in such an interesting style that one finds it hard to put it down. It can be recommended to all health officers, particularly to those at ports of entry, but can be read with great advantage by sociologists and all others who are interested in the advancement of public welfare. M. P. RAVENEL.

Health Hero Series. 1—Louis Pasteur, 2—Edward Jenner, *By Grace T. Hallock and C. E. Turner. New York: Heath. 1928. 238 pp. and 204 pp. Price, \$1.12 each.*

The narrative of modern public health can best be told in a series of biographies, for the story of health is the story of men. The recital of the notable events which have resulted in the conquest of disease is, furthermore, particularly suitable for schoolroom use, for in studying the lives of the heroes of health, the youth of the nation receive inspiration as well as instruction. They will get both from these two excellent books, which are fortunate in having as their authors, a trained writer interested in science and a capable scientist.

No more fitting subject could have been chosen to inaugurate this series than the career of the founder of preventive medicine, while that of the first protagonist of vaccination is an acceptable second. This biography of Louis Pasteur is concise, yet complete, and all of the notable episodes in the life span of the eminent scientist are arrayed before the reader. Even the mature sanitarian who desires a succinct account of the greatest of his predecessors in the field of public health could read this little volume to advantage.

The story of Pasteur is more humanly told than is that of Jenner. At times the latter becomes somewhat detailed and often it is a tract on vaccination. This, of course, is not objectionable, except to the ubiquitous anti-vaccinationist, who may fume over it, and the book is packed

with useful information about this one certain preventive of smallpox. The life of Jenner obviously could not be as dramatic as that of Pasteur, for Jenner made only one noteworthy contribution to human progress, whereas Pasteur gave us many.

These two books can be highly recommended for the purpose for which they are designed, as school textbooks. They are attractively and profusely illustrated and printed in a flawless manner. There is a good index in each. It is to be hoped that more books of a similar nature will be forthcoming from the same or equally gifted authors. JAMES A. TOBEY

Your Weight and How to Control It, A Scientific Guide by Medical Specialists and Dietitians—Edited by Morris Fishbein, M.D. New York: George H. Doran, 1927. 260 pp. Price \$5.00.

This book is the outcome of the first Adult Weight Conference, which was attended by 22 physicians and dietitians. It consists of two parts, the first of which is made up of a series of articles which were printed in the *Sunday Magazine* of the *New York Herald Tribune*. The second part gives the Principles of Nutrition, with a series of diets and menus for gaining or reducing weight respectively.

The keynote of the book is that normal weight is closely related to health. The modern craze for reducing is hard-hit in a series of papers showing the irrational ideas held by the majority of people. The effect of reducing irrationally and to too great an extent is discussed from various standpoints, including the nerves, tuberculosis, skin, etc. The dangers of beauty operations and removal of fat are shown, and the many widely advertised mail-order fakes are adequately discussed.

Approximately one-half of the book is given to a clear discussion of the principles of nutrition. A large number of diets, menus and weight tables are

included. The tables give one hundred calorie portions, both in measurements such as the ordinary person uses—tablespoons, cups, etc.—as well as their weight. These weights are apparently given in ounces, though there is no statement to this effect, an omission which should be corrected.

The book deserves a longer review, but the number of authors and contents render this difficult. We can only say further that it is by far the most useful book on this subject for the average reader with which we are acquainted, and we wish for it a wide circulation. It is well printed on light paper with a mat surface, rather a rare occurrence for a book published in America.

M. P. RAVENEL

A Son of Mother India Answers—By Dhan Gopal Mukerji. New York: Dutton, 1928. 112 pp. Price \$1.50.

Mother India was a book of horrors, for which the only excuse could have been a desire to better conditions. The present book has what Miss Mayo's book often lacked, exact references to official documents, which we are compelled to believe disprove many of the statements made in *Mother India*.

The author charges Miss Mayo with misunderstanding, with selecting isolated cases, with suppressing facts which she could have easily ascertained, and even with "untruthful invention." A number of the statements in *Mother India* seemed unbelievable, even before this refutation was published. The authoress is likened to a drain inspector who concludes that the drains are the country. There are also statements from English physicians and from missionaries who assert unhesitatingly that the picture of India given by Miss Mayo is untrue and unjust. One of the worst abuses, the author shows to be due to British official votes. He even shows that one British clergyman voted against one of the reforms, even as late as 1926.

The book on the whole is temperate in tone, especially the latter part of it. The author does not pretend that some reform is not needed in India, but he shows quite plainly that it is somewhat absurd for an American to criticise certain Indian customs, even if they were correctly given. The book closes with several appendices which throw further light on the subject under discussion. Miss Mayo's book excited more than usual attention, which the author characterizes as "a sad commentary on western literature and culture," and we recommend this answer to all who are interested in fair dealing and in the betterment of conditions in India.

M. P. RAVENEL

Playgrounds of the Nation—
By Florence C. Fox, Bull. No. 20. Washington: Dept. of the Interior, Bureau of Education, 1927. 99 pp.

That teachers of civics, geography, nature study, history, and arts and crafts can draw upon the state parks and forests for interesting classroom material is proved by the facts offered in this pamphlet. The text is interesting and the book is profusely illustrated.

Mosquito Surveys. A Handbook for Anti-Malarial and Anti-Mosquito Field Workers—*By Malcolm E. MacGregor, M.A. New York: Wood, 1928. 203 pp. Price \$5.50.*

This 203-page book is described by the author as a handbook for anti-malarial and anti-mosquito field workers. In a broad sense it can hardly be classed as such as it is decidedly limited in information relative to anti-mosquito control measures. In this treatise the author has reported in detail, his investigations on the biology and bionomics of mosquitoes (especially *Anopheles*) of the Island of Mauritius in the South Indian Ocean, about 500 miles east of Madagascar.

The book is arranged in three parts.

The first is devoted to a primary classification of mosquitoes, the anatomy of the egg, larva, pupa and adult, together with their life history and characteristics. There are many interesting line diagrams illustrating this section. Part II is given over to a classification and description of the mosquitoes of Mauritius and Rodriguez. In Part III the author describes laboratory and field technique for the entomologist and field work on mosquito control and research activities.

The treatise is a valuable contribution and commends itself to all interested in mosquito control work. It is to be hoped that in later editions the author will add a fourth part devoted to practical information and reports on mosquito control methods.

ARTHUR E. GORMAN.

Physical Chemistry and Biophysics—*By Matthew Steel, Ph.D. New York: Wiley, 1928. 372 pp. Price \$4.00.*

This book is designed to fill a real need, namely, a text of physical chemistry designed for students of biology and medicine. On the whole it is carefully written, though it seems a bit wordy. Especially Chapter II, on the "Nature and Structure of Matter," seems to contain much material which, considering the present state of our knowledge, might well be omitted. The chapter on "Diffusion and Osmotic Pressure" is better than those found in many elementary books. The treatment is somewhat vague in places, but at least it is not incorrect. The section on "Emulsoids," pages 282 to 310, follows very closely the treatment given by Jaques Loeb.

The fundamental objection to the book as a text in this particular field is the absence of numerical problems. Otherwise it seems to cover the subject completely, fairly accurately and quite lucidly, and it is hoped that in a later edition the lack of numerical problems may be remedied.

ALLEN E. STEARN

Lister As I Knew Him—By John Rudd Leeson, M.D., C.M. (Edin.) M.R.C.S. New York: William Wood, 1927. 212 pp. Price, \$3.50.

The Life of Lord Lister, by Sir Rickman Godlee, will, we believe, always remain the classical work on this great man. However, several shorter books have appeared giving more intimate stories of him as a man, as well as a number of articles, some of which have been reviewed in these columns, and all of which have brought us into closer contact with Lord Lister than the classic mentioned above. Among the shorter books, that by the present author is easily the best. After observing something of Lister's work at Edinburgh, he began as a dresser for him, then became surgical clerk, and remained always a great admirer and friend.

Some very striking contrasts are brought out. Dr. Leeson began his studies in St. Thomas's Hospital, which was in a new and airy situation on the Thames Embankment, where there was much more sunlight than is usual in the City of London. The buildings and apparatus were entirely new, and the hospital was the first to be built on the pavilion system, while the nurses belonged to the institute started by Florence Nightingale. The staff was made up of many of the most noted men in England; yet we are told, "so far as surgery was concerned . . . the old enemies pyemia, septicemia and erysipelas were as rife as ever," though they were generally attributed to overcrowding and dirt. On the advice of Murchison, Dr. Leeson went to Edinburgh where he was greatly distressed by the appearance of Lister's wards. They were gloomy, forbidding and overcrowded, but to his astonishment, he found that the patients were free from pain and cheerful, that there was little suppuration of wounds, none of the dreaded pyemia so common at that time, and that many of the patients seemed to remain in bed only because

there was nowhere else to put them. It soon became apparent to him that Lister's antiseptic treatment, combined with the individual care given to each patient, was the secret of the unusual results.

There is much history in the book, especially concerning the development of antiseptic surgery. The intimate history given of Lord Lister is particularly interesting, and the book fascinates one more than does the larger work of Sir Rickman Godlee.

Some three pages are given to "Aphorisms and Precepts," most of which the author believes were original, but as he says, Lord Lister constantly told his students that this or that was "learnt from Mr. Syme." If the book contained nothing else than these sayings, it would be well worth reading.

It is written in a most fascinating manner, contains numerous interesting illustrations, and is well printed on light paper. We cannot do better than to close by a quotation which contains really the meat of the whole book: "Transcendent as were his epoch-making discoveries, the man was more than the message."

M. P. RAVENEL

Infectious Diseases and Aseptic Nursing Technique—D. L. Richardson, M.D. Philadelphia: Saunders, 1927. 182 pp. Price, \$1.50.

In the first part of the book, one gets a clear cut picture of each communicable disease from the medical aspect—etiology, period of incubation, symptoms and signs, complications, prognosis, and treatment. There is no discussion of the nursing care of the patient in relation to the course of the disease nor of the treatments carried out by the nurse. The diseases are considered with very little reference to community health and to the need for public health education in relation to the prevention and control of communicable diseases, and to the part the nurse plays in this education.

Measures of disease control in home

care of the sick are treated in a general way in one chapter at the close of the discussion of the 28 diseases, but the treatment of these measures lacks the particular applications of principles that would make such a book very valuable.

In the second part, there is an excellent description of the nursing technic carried out in the disease-unit system as practiced in the Providence City Hospital. This detailed account of aseptic procedures would be very useful to anyone who was about to set up this particular technic.

Dr. Richardson's book is very useful as a reference book for the medical aspect of communicable diseases and for one particular type of aseptic procedure in the care of communicable diseases.

OLIVE A. ALLING

Freshman Hygiene. Personal and Social Problems of the College Student—By *Raymond C. Bull, M.D., and Prof. Stanley Thomas, Lehigh University. Philadelphia: Lippincott, 1926.* 288 pp. (ill.) Price, \$2.00.

This book is the outgrowth of extended experience with college freshmen in an attempt to build up the health service on a solid foundation of theory and practice. The text apparently presupposes a perfect blank in the mind of the student so far as concerns any organized knowledge about that portion of the universe which is sometimes called "living." The style does not assume too much in the way of intellectual capacity and may therefore indicate, much as we hate to admit it, that the average intellectual level of college freshmen is lower than is commonly supposed. Two-thirds of the book contains some twenty chapters on the usual topics taught in the high schools under the name "Physiology and Hygiene," and is on the whole sound in its information and in its counsel. The last third of the book, under the title "Social Hygiene," is made up of a dozen

chapters on reproduction, the venereal diseases, and "Civic Aspects of Social Hygiene."

The distribution of the material gives the impression that those in charge of the instruction have not yet sufficiently mastered either the technic of instruction, nor the technic of handling the students so as to integrate the information and the guidance which they offer in a manner calculated to help the student organize his own experience most effectively.

While the contents are on the whole quite acceptable—and quite within the comprehension of high school students, there is a certain formality and there is a certain dogmatism which suggests the need for a more thorough study of the problem of health education from the point of view of modern psychology and pedagogy.

This book should be of great help in institutions which have to rely upon the book for introducing the student to habits, to attitudes, and to information which ought normally to have been assimilated before college age is reached.

B. C. GRUENBERG

Cleanliness and Health—By *Turner and Collins. New York: D. C. Heath and Co., 1926.* 263 pp. Price, \$.88.

This is the second book resulting from the authors' studies and experimental work in health education in the elementary and junior high school grades of Malden, Mass. The reasons for practicing health habits and acquiring health knowledge are carefully set forth from a physiological and biological basis. It is not a text on physiology, but gives a sufficient introduction to the subject in order to make clear the basic reasons for healthful living.

A considerable part of the book is devoted to a discussion of cleanliness in relation to bacterial life as found in soil and dirt, and the prevention of infections. It defines cleanliness as the ab-

sence of dirt, and incidentally of bacterial life. Molds, bacteria, and yeast are described and illustrated, and the work of Jenner and Pasteur briefly told in relation to the origin of vaccination and the science of bacteriology.

Certain important parts of the body, such as the teeth, stomach, intestinal tract, lungs, and the skin are described and illustrated. The prevention of dental decay, the health of the digestive tract and the skin, the prevention of colds, and the control of typhoid fever and tuberculosis are carefully discussed. One chapter is devoted to the care of foods, and another to the harmful effects of alcohol and tobacco.

The book is an excellent text for health instruction in the upper grades and junior high schools, and should be a good guide for teachers who do not depend upon a textbook in the classroom. It is an excellent introduction to a more advanced study of physiology. The book is splendidly written and the material scientifically accurate. Teachers in the upper elementary grades and junior high schools will welcome it.

WILLIAM DEKLEINE

Noxious Gases and the Principles of Respiration Influencing Their Action—By *Yandell Henderson and Howard W. Haggard*, New York: Chemical Catalog Co., 1927. 212 pp. Price, \$4.50.

This book represents a rather novel departure from the usual method of treatment of the subject of poisonous gases. It has generally been the practice to approach this subject from the point of view of the pharmacologist. In the present instance, however, the subject has been approached from the point of view of the physiologist, and Drs. Henderson and Haggard have brought their wide experience in the field of respiratory physiology to bear on this very important problem. The result has been an exceedingly valuable contribution.

The first three chapters are devoted to a general survey of the field and to a discussion of the basic elements of respiration and its control. A chapter deals with the various physical laws relating to gases and vapors. The absorption, distribution and elimination of volatile substances are discussed in a general way. The various types of noxious gases are considered, and prevention and treatment of poisoning are treated.

There has long been a need of a book such as the one under discussion, for here instead of considering the gases from their chemical viewpoint they are regarded and classified from the point of view of the action which they bring about in the human body. Accordingly, the gases have been classified as asphyxiants, irritant gases, volatile drugs and drug-like substances, and inorganic and organo-metallic gases. In each group the various gases are rather completely discussed from the point of view of toxicology with tabulations showing the various physiological and toxicological effects as obtained from the literature. With the exception of benzol the discussion seems to be admirably handled. In the case of this substance, however, it would appear that the authors have failed to make complete use of the report which was recently published by the National Safety Council.

Each chapter closes with a bibliography of pertinent references.

LEONARD GREENBURG

Body Build: Its Development and Inheritance—*Bull. No. 24 Eugenics Record Office*—By *C. B. Davenport*. Cold Spring Harbor, N. Y.: 1925. 42 pp.

This pamphlet is an abstract of a volume of the same title, Publication No. 329 published by the Carnegie Institution of Washington. This abstract has been prepared so that the study contained in the original volume will be available more easily for students and workers in the field of eugenics.

Some Administrative Aspects of Scarlet Fever—*Reports On Public Health and Medical Subjects No. 35. Being a report on current English public health practice in the control and treatment of Scarlet Fever, prepared by Allan C. Parsons, M.R.C.S., with the assistance of a Committee of Medical Officers of the Ministry of Health, from materials furnished, in large part, by Medical Officers of Health and Superintendents of Isolation Hospitals.* London: Published by His Majesty's Stationery Office, 1927. 368 pp. Price, \$1.80.

This report shows the thoroughness with which the English are accustomed to study things, and the conclusions are characteristically conservative. The meat of the whole report is summed up in the prefatory note by Sir George Newman.

Neither the cause of nor immunization against scarlet fever is considered, though the opinion is expressed that "immunization, natural or acquired, is the biological answer to disease."

The minimum period of detention varies in the sixty hospitals investigated, from 28 to 42 days, though the Metropolitan Asylums Board seems to favor a longer period. In Brook Hospital, 67 days was the average in 1924. The tendency in America, especially since antitoxic serum has come into use, is to shorten this period. The English board concluded that as a routine procedure, 4 weeks for uncomplicated cases was long enough. In other cases, the period of detention must be determined by the presence of discharges, general health, etc. The board does not regard the discharge of patients in the late stages of desquamation as a danger to public health.

In England the detention hospitals are overcrowded, and it is believed that too much space is taken up with scarlet fever. From 1917 to 1926 inclusive, there were only 10,672 deaths from scarlet fever, though during the same period, there were 58,292 deaths from measles,

392,942 from pneumonia, and 13,645 from epidemic diseases affecting the central nervous system. It is clear that the old dread of scarlet fever still affects the public as well as the medical profession. These considerations have led to a study of home treatment, and the board concludes that the latter has not received the attention which it deserves.

Terminal disinfection has been discontinued by certain officers, and it is shown, quite conclusively we think, that neither disinfection by steam nor fumigation, nor a combination of the methods, has any value in lessening the number of secondary cases. Fairly extensive studies have shown that hemolytic streptococci are found in the throats of many patients and may retain their vitality under conditions simulating those of the sick room for 50 days. It is pointed out, however, that scarlet fever is seldom conveyed by inanimate objects, and the very rational conclusion, which has been preached in this country for a number of years, is that current rather than terminal disinfection is the efficient method. Sterilization of food utensils and the destruction of remaining portions of foods are advised.

The report can be especially recommended to health officers and those engaged in any way in the prevention of disease.

M. P. RAVENEL

The Rise and Fall of Disease in Illinois—*By Isaac D. Rawlings, M.S., M.D., in collaboration with William A. Evans, M.D., D.P.H., Gottfried Kochler, M.D., and Baxter K. Richardson, A.B. Graphs developed and drawn by A. F. Dappert, and pictures of many persons associated with the story. Indexed by Clara Breen. Springfield, Ill.: Schnepp & Barnes, 1927. 432 pp.*

This volume has been issued in commemoration of the fiftieth anniversary of the founding of the State Department of Public Health of Illinois. It falls naturally into two parts, the first of

which treats of health conditions as far back as is permitted by the history of the state and the records. The second is devoted to conditions since the founding of the State Board of Health, and the establishment of correct records.

The introduction gives a brief, but interesting history of the territory itself. The history of men's struggles against the forces of nature is always interesting, especially when they are pioneers winning new lands for cultivation and settlement. This story has particular interest for the members of our Association, as John Henry Rauch was a member of the first Board of Health of Illinois, organized July 12, 1877, on which he served until 1891, his death occurring some three years later. He served first as secretary, then as president of the board, and as told in *A Half Century of Public Health*, was an unusually active man, not only in his health activities, but also in research. He was throughout his connection with the state board "easily the central figure of public health machinery and thought in the state."

Dr. Rauch was the fourth president of the American Public Health Association, his election having taken place in 1877.

The volume carries us through struggles of a midwestern state, much of which was in a district infested with malaria, and on account of its situation, subject to water-borne diseases. It is the story of a successful struggle of science against nature, directed by men with ideals as well as energy.

There are many biographies of the pioneer workers, all of whom played their part in the creation of health sentiment throughout the state, and in the establishment of a board of health which is recognized as one of the best in the country.

The book as a whole is really a history of preventive medicine, beginning about the time when bacteriology was coming to be such a potent factor in

health work. It is well and interestingly written, abundantly illustrated, and well put together as a permanent record. It can be cordially commended to all who are interested in public health work.

M. P. RAVENEL

The Canadian Mothers Book, Mothers Series, No. 1.—By Helen MacMurchey, M.D. Issued by the Department of Health, Ottawa, Can. 163 pp. Obtainable upon request.

It would be difficult to find a better baby book than this little paper-covered *Blue Book* of 163 pages including the excellent index. It is up-to-date to the least detail and covers in a most pleasing manner the essential points in maternal and child care.

One point in particular is worthy of note and something it would always be well to remember in preparing books for mothers, that is: the reiteration of the father's share in the home. The appeal to sentiment of the right sort is well done but not overdone, and the positive note throughout, a great improvement on the old way of multiplying "don'ts" for parents.

In matters of diet a few items are interesting and a bit out of the ordinary. A salt-free diet the first week of every month after the fifth is advocated. Cod liver oil for pregnant mothers as well as for the baby is recommended.

Proper care of cows to produce the best milk for babies and the necessity of fresh air and sunlight for herds are duly emphasized.

Many things are mentioned which are most helpful to mothers and rarely covered, such as a list of "presents" for the new baby and knitting directions for various useful articles in the baby's wardrobe.

A standard weight chart is included with the book and the attractive photographs of "real" children add much to the general make-up.

MERRILL E. CHAMPION

The Teeth and the Mouth—
By LeRoy L. Hartman, D.D.S. *New York: Appleton, 1927.* 93 pp. Price \$1.50.

This little volume is essentially a primer for the mass of grown-ups for whom oral hygiene and the art of dentistry is either a jumble of half truths and superstition or an entirely closed book. In question and answer form the author treats some 116 queries which the layman might properly desire knowledge upon, in simple, easily understandable language. The subject is considered from the point of view of the infant (and its mother) up to 6 years of age, the school child period, and the period of

adult life. The subject is surprisingly well covered in a non-technical way in these few pages, though still more emphasis on the importance of preventive dentistry (with a discussion of how preventive dentistry differs from palliative or curative dentistry) might have been expected.

The book would have been improved by a brief interesting statement emphasizing the present status of oral hygiene and pointing out that the chief hope for the future lies in early preventive dentistry. A short glossary of the few inevitable technical words would have been a valuable companion to the excellent index. PHILIP S. PLATT

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Carbon Arc Irradiation—Systematic irradiation with the carbon arc had no effect in reducing the incidence of colds—an experience comparable to that with the mercury vapor light. There was only slight pigmentation of the skin.

BARENBERG, L. H. Effect of Carbon Arc Irradiation on Infants. *J.A.M.A.*, 90:7 (Feb. 18), 1928.

Dangerous Dieting—An ample and balanced diet is the plea of this paper inveighing against the alleged dangers of dieting. According to the bread bakers "normal appetites are the best determinators of the kind and amount of food required," a statement which we doubt.

BARNARD, H. E. The Trend of Nutritional Science. *Boston M. & S. J.*, 197:31 (Feb. 2), 1928.

Occupational Effect Upon Sickness Rates—This is a report on the frequency of sickness of one or more

days' duration covering a period of three years. Detailed statistics by occupation, age, sex, and length of service are presented.

BRUNDAGE, D. K. Sickness Among Persons in Different Occupations of a Public Utility. *Pub. Health Rep.*, 43:6 (Feb. 10), 1928.

Minor Mental Disorders—A test of a large number of industrial operatives in England indicates that a large proportion of the population suffer from minor psychoses which, in some industries, result in considerable loss of time.

CULPIN, M. Incidence of the Minor Psychoses. *Lancet*, 1:5 (Feb. 4), 1928.

Are Vacuum Cleaners Dangerous?—A typically thorough British inquiry into the possible public health menace of the vacuum cleaner. Dust impregnated with bacteria was found to pass the filter bag in sufficient amount so that the same bacteria could be recovered

from the filtered air. What this proves is not quite clear, but it is hoped that the terrifying evidence will not prove a deathblow to this useful household appliance.

EYRE, J. W. H. Vacuum Cleaners and the Public Health. *Med. Off.*, 39:3 (Jan. 21), 1928.

Ventilating Dairy Barns—This is a discussion of the relative merits of the King, Rutherford, and Fairbanks systems of natural ventilation of dairy barns, which should be known to all health officials concerned in dairy inspection. *N. Y. State College of Agriculture Extension Bulletin No. 151* covers the subject.

FAIRBANKS, F. L. Dairy Stable Ventilation. *J. Am. Soc. Heat. & Vent. Eng.*, 34:2 (Feb.), 1928.

Examination of "Well" Patients—"What a 'well' patient thinks about" might be the topic of this paper (with apologies to Briggs), which should prove interesting to all health officials who are concerned in any way with health examinations.

FITZ, R. Clinical Observation on "Well" Patients. *Boston M. & S. J.*, 197:31 (Feb. 2), 1928.

Scarlet Fever Variants—This paper presents a table of distinguishing clinical features to be used in differentiating between morbilli, rubella, true scarlet fever, para-scarlet A, and para-scarlet B.

FRIEND, G. E. Some Cases of a Scarletiform Type. *Lancet*, 1:6 (Feb. 11), 1928.

Testing for Typhoid Immunity—The filtrates of *B. typhosus* produced an allergic reaction in immune patients and a negative reaction in apparently susceptible persons. The authors suggest the test as useful in determining if immunity has been established in an individual.

HOWELL, K. M., and CORRIGAN, M. Skin Reactions with Bacterial Filtrates of . . . *B. Typhosus*. *J. Infect. Dis.*, 42:2 (Feb.), 1928.

Young Women and Tuberculosis—The failure of the tuberculosis rate to decrease as rapidly among women as among men of the same age group is laid to the desire for a boyish figure, improper diet, flimsy dresses, thin stockings, tight brassieres, slouchy posture, cigarette smoking, insufficient sleep, unhygienic environment, too infrequent examinations, too much study. The only possible factors the author seems to have omitted are gin or petting parties.

KNOPE, S. A. Tuberculosis Among Young Women. *J.A.M.A.*, 90:7 (Feb. 18), 1928.

Experimental Pellagra—Dogs fed a pellagra-producing diet developed a condition indistinguishable from the disease known as black tongue.

GOLDBERGER, J., and WHEELER, G. A. Experimental Black Tongue of Dogs and Its Relation to Pellagra. *Pub. Health Rep.*, 43:4 (Jan. 27), 1928.

Measles Control—A rational plan of preventing infants from being exposed to measles infection is offered as an emergency program for any community facing a measles epidemic.

HOILES, B. S. Measles a Community Emergency. *Pub. Health Nurse*, 20:2 (Feb.), 1928.

A Resurvey of Cincinnati Thyroids—Three years after the original survey a considerable reduction of moderate and marked goiters was found, and the age incidence was lower. Iodized salt and more interest on the part of parents and physicians are given as the causes.

OLESEN, R. A Resurvey of Endemic Thyroid Enlargement in Cincinnati. *Pub. Health Rep.*, 43:3 (Jan. 20), 1928.

Antityphoid Vaccination—The value of antityphoid vaccination is shown not only in the experience in protecting the navy personnel but in the Virgin Islands as well. The author asks why we should not require general vaccination: there are several reasons why we do not, which are generally appreciated by health officials.

PRYOR, J. C. Antityphoid Vaccination in the United States Navy; Experience of 14 Years. U. S. Nav. M. Bull., 26:1 (Jan.), 1928.

Newspaper Publicity—Why a case of communicable disease is news, and how the item should be utilized is the burden of this abstract.

SLEE, R. Modern Health Officers. New York State J. Med., 28:3 (Feb. 1), 1928.

Intradermal Smallpox Vaccination—A valuable record of 2769 primary vaccinations, 97.8 per cent of which were positive. The intradermal method of administration has so many advantages and is so clearly the most efficient method that any other should be prohibited for group application.

TOOMEY, J. A., and HAUVER, R. B. Intradermal Vaccination. Am. J. Dis. Child., 35:2 (Feb.), 1928.

Cattaraugus Infant Deaths—The gratifying decline in infant death rates

in Cattaraugus County during the demonstration was almost wholly due to decreases in deaths from the communicable diseases. In the same bulletin is a notice that the county health work will be continued along essentially the same lines by the County Health Board, despite the opposition of the Medical Society.

WIEHL, D. G. Infant Mortality in Cattaraugus County. Milbank Quarterly Bull., 4:1 (Jan.), 1928.

Nursing Visits—This second installment of a discussion about measuring nurse power presents many interesting conclusions. One nurse per 2250 urban or 3300 rural population is suggested. Opportunities for extended study of nursing problems are numerous.

WINSLOW, E. A. More About the Measurement of Nurse Power. Pub. Health Nurse. 20:2 (Feb.), 1928.

KEY TO ABBREVIATIONS

Am. J. Dis. Child.—American Journal of Diseases of Children, American Medical Association, 535 N. Dearborn St., Chicago.

Boston M. & S. J.—Boston Medical and Surgical Journal, 126 Massachusetts Ave., Boston.

J. A. M. A.—Journal of the American Medical Association, 535 N. Dearborn St., Chicago.

J. Infect. Dis.—Journal of Infectious Diseases, 637 South Wood St., Chicago.

Lancet—The Lancet, 423 Strand, London.

Med. Off.—The Medical Officer, 36-38 Whitefriars Street, London, E. C. 4.

Milbank Quarterly Bull.—Milbank Memorial Fund, 49 Wall Street, New York.

U. S. Nav. M. Bull.—United States Naval Medical Bulletin, Government Printing Office, Washington.

New York State J. Med.—New York State Journal of Medicine, 2 East 103 Street, New York.

Pub. Health Nurse—Public Health Nurse. The National Organization for Public Health Nursing, 370 Seventh Avenue, New York.

Pub. Health Rep.—Public Health Reports, Superintendent of Documents, Government Printing Office, Washington.

BOOKS RECEIVED

- FOOD INFECTIONS AND FOOD INTOXICATIONS. By Samuel Reed Damon. Baltimore: Williams and Wilkins, 1928. 266 pp. Price, \$4.00.
- LAUGHTER AND HEALTH. By James J. Walsh. M.D. New York: Appleton, 1928. 197 pp. Price, \$1.50.
- STANDING ROOM ONLY? By Edward Alsworth Ross. New York: Century, 1927. 368 pp. Price, \$3.00.
- A SON OF MOTHER INDIA ANSWERS. By Dhan Gopal Mukerji. New York: Dutton, 1928. 112 pp. Price, \$1.50.
- INTERNATIONAL HYGIENE. By C. W. Hutt, M. A., M.D., D.P.H. London: Methuen & Co., 1927. 261 pp. Price, \$3.00.
- HANDBOOK ON DIET. By Eugene E. Marcovici. M.D. Philadelphia: Davis, 1928. 323 pp. Price, \$3.50.
- FUNDAMENTALS OF DAIRY SCIENCE. By Associates of Dr. L. A. Rogers. New York: Chemical Catalog Co., 1928. 543 pp. Price, \$5.50.
- HOW TO COOK FOR CHILDREN. By Estelle M. Rellly. New York: Putnam, 1927. 250 pp. Price, \$1.75.
- A COURSE IN GENERAL BIOLOGY. A Laboratory Manual. By Henry Sherring Pratt, Ph.D. New York: Ginn, 1928. 178 pp. Price, \$1.48.
- MONGOLISM. A Study of the Physical and Mental Characteristics of Mongolian Imbeciles. By Kate Brousseau and H. G. Brainard, M.D. Baltimore: Williams & Wilkins, 1928. 210 pp. Price, \$4.50.
- EVERY GIRL'S HEALTH. Vols. I and II. 1924 and 1925. New York: The Womans Press. Vol. I, 40 pp. Vol. II, 70 pp. Price \$.75 each.
- FEEDING THE CHILD FROM TWO TO SIX. By Mary Frances Hartley Barnes. New York: Macmillan, 1928. 206 pp. Price, \$2.50.
- SYSTEMIC AND FOCAL IMMUNIZATION THROUGH IRRADIATION. By S. Peskind, B.S., M.D. Cleveland: Author, 1928. 30 pp.
- THE PROHIBITION MANIA. By Clarence Darrow and Victor S. Yarros. New York: Boni & Liveright, 1927. 254 pp. Price, \$2.50.
- THE CONCISE OXFORD DICTIONARY. Adapted by H. W. Fowler and F. G. Fowler from The Oxford Dictionary. New York: Oxford University Press, 1926. 1064 pp. Price, \$3.50.
- AN ELEMENTARY TEXT BOOK OF GENERAL MICROBIOLOGY. By Ward Giltner. Philadelphia: Blakiston, 1928. 471 pp. Price, \$3.50.
- THE PRINCIPLES OF ANTE-NATAL AND POST-NATAL CHILD HYGIENE. By W. M. Feldman, M.D., B.S., London: John Bale, Sons & Danielsson, 1927. 743 pp. Price, \$7.50.
- UNIVERSITY OF IOWA STUDIES IN MEDICINE. Vol. III, No. 1. Collected Studies and Reports. Published by the University, Iowa City.
- CODIFICATION OF ORDINANCES. By E. D. Greenman. New York: Municipal Administration Service, 1928. 49 pp. Price, \$.25.
- STUDIES OF MENTAL DEFECTS AND HANDICAPS. By J. E. Wallace Wallin, Ph.D. Oxford, Ohio: Miami University, 1925. 177 pp. Price, \$.75.
- THE PRESCHOOL SERVICE IN A GENERAL HEALTH PROGRAM. New York: East Harlem Nursing and Health Demonstration, 1927. 123 pp. Price, \$.55.
- THE SUNSHINE SCHOOL. By J. Mace Address and Mabel C. Bragg. Boston: Ginn, 1928. 185 pp. Price, \$.72.
- SUNSHINE AND HEALTH. By Ronald Campbell MacFie, M.B.C.M., LL.D., New York: Holt, 1927. 256 pp. Price, \$1.00.
- HEALTH HEROES. EDWARD JENNER. By Grace T. Hallock and C. E. Turner. New York: Heath, 1928. 204 pp. Price, \$1.12.
- LOUIS PASTEUR. By Grace T. Hallock and C. E. Turner. New York: Heath, 1928. 238 pp. Price, \$1.12.
- THE MENTAL HEALTH OF THE CHILD. By Douglas A. Thom, M.D. Cambridge: Harvard University Press, 1928. 46 pp. Price, \$1.00.
- THE HARVEY LECTURES. Delivered under the Auspices of The Harvey Society of New York 1926-1927. Baltimore: Williams & Wilkins, 1928. 164 pp. Price, \$4.00.
- NUTRITION AND DIET IN HEALTH AND DISEASE. By James S. McLester, M.D. Philadelphia: Saunders, 1927. 783 pp. Price, \$8.00.
- SCHOOL MARCHES AND RHYTHMS. By Edna Everett. Chicago: Beckley-Cardy Co., 1927. 61 pp. Price, \$.90.
- SIXTEENTH ANNUAL REPORT OF THE INTERNATIONAL ASSOCIATION OF DAIRY AND MILK INSPECTORS. Including papers read at the Annual Convention in Toronto, Ont., Oct. 24-26, 1927. Compiled by Ivan C. Weld, Secretary-Treasurer. Washington, D. C., 1927. 342 pp. Price, \$2.00.
- HEREDITY AND HUMAN AFFAIRS. By Edward M. East. New York: Scribner, 1927. 325 pp. Price, \$3.50.
- BACTERIAL VACCINES AND THEIR POSITION IN THERAPEUTICS. By Leonard S. Dudgeon. New York: Hoeber, 1927. 87 pp. Price, \$2.50.
- CRITICAL STUDIES IN THE LEGAL CHEMISTRY OF FOODS. By R. O. Brooks, B.Sc. New York: Chemical Catalog Co., 1927. 280 pp. Price, \$6.00.

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

National Federation of Day Nurseries—A report of the conference of this organization held in May, 1927, is worthy of careful study by anyone interested in child welfare problems. The report itself has been carefully prepared and printed, and the contents give much valuable information regarding several important subjects, including habit training, health problems, and varying types of nurseries. The biennial report of the president is stimulating, and indicates a broad conception of the problem of day nurseries. Modest reference is made to the recent publication of a new dietary for use in nurseries. A careful study of this dietary suggests that it would be exceedingly useful by many groups concerned with child welfare clinics and nutrition classes. "Nowhere is the spirit of progress more evident than in the growing concern of society for the well-being of the children. . . . There is a larger recognition than ever before of the fact that the future of the State depends upon the child of today. We, of the Federated Day Nurseries, must lead in the solution of all such problems as come properly within our province."

New Orleans—Bound in light blue covers, and occupying 127 pages, the biennial report of the health board of the Parish of Orleans and City of New Orleans presents a comprehensive picture of the work during 1925 and 1926. The crude death rate for white persons was 14.53 and for colored persons, 29.06, and for all persons combined, 18.32, in 1926. During the year, 2 cases of bubonic plague were reported, both being Japanese seamen, sick at the time of arrival.

Immunization measures were inaugurated to prevent diphtheria and scarlet fever in orphan asylums and in child

welfare clinics. Health department expenditures for the year 1926, according to a classified statement, amounted to \$234,319, an increase of over \$7,000 over the previous year. The population in 1926 is recorded as 433,000. One of the features of the report is a table showing the number of deaths; population, and death rates by years, beginning with 1787.

Mosquito Extermination Commission—The 15th annual report of the Atlantic County (N. J.) mosquito extermination commission reviews the work of the 1927 season and is illustrated with several excellent photographs. The problems and possibilities of a mosquito extermination program are set forth in a manner to interest both laymen and technical workers in the field. It is stated that the salt marshes of New Jersey cover approximately 200,000 acres and account for many millions of two species of salt marsh mosquitoes. Heavy mosquito breeding follows abnormal, high tides, when the water brought up is not all drained off on the low tide but remains in the holes and depressions or on the meadow surface. This commission is evidently carrying on an active and successful extermination campaign. The total footage of new ditches for the year was 578,225 feet, making a total footage to date of over 10 million feet.

National Dairy Council—Methods of health education employed by the council in various parts of the country are described in the last annual report. In its educational work, emphasis has long been given to health as the great objective. Optimism is a keynote in this record of progress during a 7-year period. On the basis of Department of Agri-

culture figures, it is calculated that the per capita consumption of milk and its products during 1926 were 24 per cent greater than in 1920. Seven per cent fewer cows gave 34.7 per cent more milk than in 1920.

The work of the council was first concentrated, to a large extent, in schools. As the organization of these activities has become perfected, the work has expanded to reach adult groups. The nutrition department functions through different types of health and welfare agencies, coöperation having been established, for example, with 35 health departments in 25 states. There were supplied material, projects and exhibits to emphasize the need of proper diet, and the observance of the health rules. It is gratifying also to note that the need of pasteurization has been emphasized.

Racine, Wis.—Racine's annual report of 50 mimeographed pages again illustrates how an attractive and enlightening report may be prepared at a reasonable cost. The report is bound in heavy paper covers with an attractive front cover. Blue prints show graphically the birth and general death rates and important specific death rates from 1916 to the present time; and also the results of the appraisal of city health activities. A table of contents and a health organization chart precede the main report. Another noteworthy feature is a tabular statement showing time distribution in nursing service by years, 1924-1927. One page is devoted to a classified budget statement for each year, 1924-1928.

This city of 71,300 people records a birth rate of 20.6, a death rate of 8.2, and an infant mortality rate of 50.4.

Under educational activities it is noted that 505 news stories were carried in two daily papers, while 51 lectures and public addresses were given, in addition to various magazine and other health articles. In coöperation with the tubercu-

losis association, there were prepared a pamphlet entitled "The Heart of the Business," dealing with physical examinations, and a booklet entitled "Tuberculosis—The Maker of Orphans" (for enclosure in the Christmas seal solicitation letters). The diphtheria booklet was revised, and a smallpox vaccination leaflet was prepared, entitled "When Great-Grandmother was a Little Girl." An active campaign to educate factory workers in health was launched during the year. This is an excellent report, carefully prepared, and well balanced as to statistical tables and descriptive text. It is a record of activity for a city of its size.

May Day—The Goal of May Day—A Year-round Program—is a little book published by the American Child Health Association, which gives a comprehensive child welfare program. Parents, teachers, pastors, social workers, all interested in children, will find suggestions of programs to promote the health and happiness of children in every walk of life. It is an attractive, well illustrated book, concisely and clearly written. The question and answer method is used in exposition with good effect. The importance of the school health program is stressed, with suggestions and illustrations, and the necessity of coöperation and coördination of home, school and community is brought out. Of considerable value are the bibliographies attached to various chapters, which should be stimulating to further study.

May Day, Child Health Day, is the title of the compilation of child health programs for 1927 throughout the country. To quote: "May Day was recognized and celebrated in every state in this country and in Hawaii." There were 50 May Day chairmen, and of these 36 were officials of the state boards of health. "May Day not only pours into the official health machinery of the country new currents of activity, but it serves

to interpret to a community dramatically and visually the work and aims of public health officials for the protection and encouragement of child life."

A list of the national groups cooperating includes state and government departments, lay groups such as Parent-Teacher Associations, League of Women Voters, American Federation of Labor, etc. Youth groups and, in fact, many important national organizations are listed. Abstracts in brief of the activities of these organizations, churches of various denominations, and lastly of the state programs are given. This is interesting as a record of what was done last year on May Day—also as a guide for what may be undertaken by these organizations and others this year to encourage child health.

Commonwealth Fund—The 9th annual report of the Commonwealth Fund describes the efforts to improve the physical and mental health of American children. An expenditure of \$1,953,557 last year for this purpose and for hospitals, educational and welfare work is recorded.

A 5-year demonstration of health work in Fargo, N. D., was completed and the city has made provision for the continuance of every essential activity at its own expense. Fargo's health budget for 1928 calls for an expenditure of \$1.13 per capita for health purposes as compared with \$.28 in the year prior to the opening of the demonstration. The health work of the city is rated by the American Public Health Association at 814 points out of a possible 1,000 as compared with 320 the year before the demonstration. Similar demonstrations are being continued in Rutherford County, Tenn.; Athens (Clarke County), Ga.; Marion County, Ore.; and the official scoring of public health activities in these communities already shows gains comparable to that in Fargo.

In Austria where the Fund has aided

in the support of various forms of child welfare and health work throughout the post-war period, no attempt has been made to import American public health methods, but standards of existing Austrian child health service have been raised and various extensions of the public health program have been made in accordance with the demands and understanding of each community. In the belief that the best way to improve standards is through the training of workers in strategic points throughout the country, scholarships totaling \$39,000 have been given to physicians, midwives, and welfare workers.

The Fund's program for the development of child guidance clinics, visiting teacher work in the public schools, and allied projects in the field of mental hygiene is noteworthy. A 5-year period of demonstrations and consultant service under this program, ending in June, 1927, has resulted in the establishment of community clinics for the study and treatment of children's behavior problems in Cleveland, Philadelphia, St. Louis, St. Paul, Minneapolis, Dallas, Baltimore, Richmond, Milwaukee, Los Angeles, and Pasadena. Following a series of 3-year demonstration, together with advisory and consultant service, visiting teacher work has been organized in the public school systems of 58 communities located in 32 different states. School children to the number of 15,439 have been aided by visiting teachers in the solution of their difficulties in these demonstration centers and in New York City.

An outstanding feature of the Fund's mental hygiene program was the establishment this year of an Institute for Child Guidance in New York City. This Institute is fully equipped both for research and for practical work with children who exhibit conduct disorders and personality difficulties. It also provides a center for the special training of psychiatrists, psychologists, and psychiatric

social workers. Fellowships established by the Commonwealth Fund for students at the Institute are administered by the National Committee for Mental Hygiene, the New York School of Social Work, and the Smith College School for Social Work.

For the development of rural hospitals the Commonwealth Fund appropriated \$414,000 during the year under review, making awards to Farmington, Me.; Beloit, Kan.; and Wauseon, O. Farmville, Va., and Glasgow, Ky., had received awards the previous year under this program, the objects of which are to provide modern hospital facilities in rural areas where they are needed, to assist in improving standards of local medical practice, and to provide an incentive for good physicians to remain in the country and for young physicians to go there. In accordance with a policy of coöperation which is applied so far as possible in all the Fund's local work, it is stipulated that the community shall pay a third of the cost of building and equipping the hospital and shall undertake its maintenance. The general plan includes the construction of 50-bed general hospitals in the selected areas, the development where advisable, of facilities for the training of nurses; provision for preventive and educational clinics as a part of out-patient service; fellowships to local physicians for post-graduate study; educational institutes and clinics for physicians; and the development of community public health activities in coöperation with the hospital.

Medical Education—The second report of the commission on medical education deals with the training and opinions of successful practitioners, the demands on medical practitioners, the opinions of state medical boards, and

with medical school data. It is indicated that a large majority of physicians and educators who are familiar with the problem of medical education in the United States and Canada are evidently of the opinion that the general features of present medical training compare favorably with those in other fields of education and that great improvement has occurred in recent years.

It is stated that the regulations which have probably been most important in the improvement of medical education and which are large factors in the present rigidity and overcrowding are the requirements of each state for medical licensure. The primary function of licensure is to determine the fitness of the individual to practice medicine. The chief factors determining that fitness are the character, industry, and ability of those who study medicine and the character of the medical training. Twelve states now require an internship for licensure to practice and some medical schools require the internship for the degree of Doctor of Medicine.

In regard to the medical course, it is stated that "extensive lecturing and operative clinics for large groups are criticised by some, although their use has been greatly reduced. It is the current belief that time can be more profitably spent in reading or in elective work and that lectures should be confined to the general exposition of the principles of given subjects and to suggestive correlation of the various fields of study rather than to the presentation of subject matter." It is further stated that the selection of the teaching personnel of medical schools is considered by some to be as important as the selection of students. The vital influence of stimulating teachers who are masters in their individual fields can hardly be overestimated.

NEWS FROM THE FIELD

NEW TEXAS SEWAGE SECTION FORMED

AT the January, 1928, meeting of the Texas Section, Southwest Water Works Association in Houston it was voted to form a sewage division within the association for the purpose of advancing sewage research, and then admit a broader discussion of sewage treatment problems as they affect this state.

W. S. Mahlie, in charge of the Fort Worth Water and Sewage Purification Plants, was appointed director of this sewage division. Membership in this section entitles the member to a copy of National Sewage Research publication which is to contain papers of national importance along the various lines of sewage treatment. This publication is to be issued four times a year. Membership dues for the section are \$1.00 per year and can be mailed to Mr. Mahlie at Fort Worth.

The first issue of the national publication is to be off the press July 1 and it is, therefore, desired that all those who wish to take membership in the section make their remittances to Mr. Mahlie promptly in order that he may send the list of members to the national office so that they may receive the first copy of the publication.

BUDAPEST CONFERENCE

EMERY R. Hayhurst, M.D., Fellow A.P.H.A., Ohio State University, Columbus, O., and Fred H. Albee, New York, N. Y., have been appointed Joint Chairmen of the National Committee for the United States to the Fifth International Medical Congress of Industrial Accidents and Occupational Diseases to be held in Budapest, Hungary, September 2-8, 1928. Richard Kovacs, M.D., New York, N. Y. has been appointed

Secretary of the United States committee. Dr. Hayhurst, secretary of the Industrial Hygiene Section of the A.P.H.A. will present a paper at the Budapest meeting.

PURE FOOD CONFERENCE

CHIEF food inspector S. T. Pyper, of the Cincinnati Board of Health, has been elected chairman of the Cincinnati Pure Food Conference. The conference is an organization meeting of a group that is expected to be influential in enforcing the pure food and drug acts in Ohio, Indiana and Kentucky. The conference will meet quarterly.

HOSPITAL WILL CLOSE

THE trustees of the New York Infirmary for Women and Children, 321 E. 15th St., New York, N. Y., founded in 1853 by Dr. Elizabeth Blackwell, have voted to close the institution on July 1. The reason given is that the mounting deficit of the institution is too heavy to carry. No announcement has been made as to the future disposition of the hospital's assets. The last report of the United Hospital Fund (1926) put the assets at \$1,354,697, about equally divided between property and investments. The income that year amounted to \$170,044 of which \$95,643 was earned and the total expenditures of \$196,847.

MALARIA INCREASES IN NEW MEXICO

DURING the past year there has been a marked increase in the number of malaria cases in Doña Ana County, N. M. Dr. C. W. Gerber, county health officer, prepared a report covering the situation and made definite recommendations to the county commissioners regarding the control measures to be taken. The county was unable to

finance any work this spring so the commissioners appealed to the State Board of Public Welfare for aid. As a result of this appeal, the Board of Public Welfare has borrowed \$2,500 on the credit of the state to be advanced to Doña Ana County. This money is to be used to finance necessary control measures until July 1, when the county will be able to make a levy to do the work itself. Measures to be taken include planting of top-minnows, dusting with Paris green and quinine administration.

NEW YORK STATE CANCER LABORATORY TO RECEIVE LEGACY

THE New York State Institute for the Study of Malignant Diseases is one of three organizations which will benefit by a trust fund of \$100,000 left by C. P. H. Shoellkopf of Buffalo, N. Y.

RESEARCH ON SLEEPING SICKNESS

AMONG the awards made by the John Simon Guggenheim Memorial Foundation to American scholars, scientists and artists is the fellowship granted to Dr. Warren K. Stratman-Thomas, research pharmacologist of the University of Wisconsin, for research for a satisfactory drug for treatment of sleeping sickness. Dr. Stratman-Thomas who will work with Dr. Clement C. Chesterman in the Belgian Congo, will endeavor to determine by clinical trial the therapeutic value of 6 new arsenical compounds in the chemotherapy of animal and human sleeping sickness.

PUBLIC HEALTH DISCUSSED BY MEDICAL GROUP

AT the annual meeting of the Medical Society of New York State to be held at the State Armory, Albany, N. Y., May 21-24, a section on public health has been arranged. The following program will be given:

May 22—The Source of Brucella Abortus Infection in Man, Charles M. Carpenter, M.D.,

Ithaca; Social Hygiene in Mississippi Flood Relief, Albert Read, M.D., Albany; Whooping Cough, Edward S. Godfrey, Jr., M.D., Albany; Public Health Work by County Medical Societies, Guy Turrell, M.D., Smithtown Branch.

May 23—Corrections of Physical Defects in School Children in Small School Systems. David C. McKenzie, M.D., Granville; 1928 Medical Legislation, Paul B. Brooks, M.D., Albany; Methods in Obtaining Milk Code Adoption, Hilton J. Shelley, M.D., Middletown; Laboratory Control of Milk Under New State Code, Morris Maslon, M.D., Glens Falls; Control of Impetigo Contagiosa, Ellis Kellert, M.D., Schenectady.

Dr. Leo F. Schiff, health officer of Plattsburg, is chairman of the section and Dr. William L. Munson, district state health officer, is secretary.

PASADENA'S HEALTH TOURNAMENT

A tournament of Health Week in Pasadena, Calif., April 29-May 5, has been announced by Dr. Warren F. Fox, city health officer. Special days are given over to safety first, child hygiene, hygiene, hospitals, and health education. The program will be concluded by a health parade.

MEDICAL JOURNAL CHANGES NAME

WITH the February, 1928, issue, the *Boston Medical & Surgical Journal* appeared as *The New England Journal of Medicine*. In commenting editorially upon the change of name of the journal, which had its origin in 1828, when the *New England Journal of Medicine and Surgery* and the *Boston Medical Intelligencer* amalgamated, the statement is made: "The times have changed and the sphere of usefulness of the Journal has widened and today the same Journal, under a new name opens its one hundred and ninety-eighth volume."

SAFEGUARD HEALTH IN BUILDING INDUSTRY

IN its program for the future the new aim of the American Institute of Architects will foster country-wide health and safety in the building indus-

try, according to a statement made recently by D. Everett Waid, past president of the institute and a member of the committee. Committees are cooperating with the Building Trades, Employers' Association, the Workers' Health Bureau and other organizations to safeguard life and overcome the great economic waste.

BETTER HEALTH SPECIAL

THE Missouri Pacific "Better Health Special" which for 28 days in January and February toured the state of Texas promoting health education in the 110 towns visited, proved to be an effective means of disseminating health facts. It is estimated that approximately 70,000 persons saw the exhibits and heard the lectures. The Health Special personnel included representatives of the U. S. Public Health Service, the U. S. Department of Agriculture, the State Departments of Health of Texas and Louisiana, and also railway surgeons, sanitarians and city health officers. The train was provided through the generosity of L. W. Baldwin, President, and H. R. Safford, vice-president of the Missouri Pacific Railroad.

NUTRITION BASIS OF MEMBERSHIP DRIVE OF SOUTHERN CALIFORNIA PUBLIC HEALTH ASSOCIATION

AS an opening drive for membership, the Southern California Public Health Association was fortunate in securing the services of Dr. W. D. Sansum, author and noted expert on foods and metabolism. Dr. Sansum is the author of *The Normal Diet* and the head of the Potter Metabolic Clinic at Santa Barbara. As a contribution to the advancement of public health in Southern California, he is giving a series of four lectures, the first of which was delivered February 24 on "Acidosis in Relation to Errors in Diet." The association has an associate membership of nearly one hundred.

Owing to the fact that Los Angeles County produces annually about \$90,000,000 worth of food products, and nutrition has such a close relationship to public health, the association believes much greater attention should be given this subject than has been the practice in the past. It hopes to develop a close relationship between the large corporations engaged in handling food stuffs and the Southern California Public Health Association.

A committee, of which Dr. Warren F. Fox, Health Officer of Pasadena, is chairman, has been engaged in making a study relative to the subject of milk in relation to the spread of communicable disease, and will soon present its report. Recent agitation throughout the country on the subject of whether all milk should be pasteurized has made this committee necessary.

Pasadena is now housed in her own Civic Center, costing well over \$1,000,000 and the Health Officer is occupying a new suite of offices, which places Pasadena in the forefront with one of the best equipped departments in the United States.

Ground was broken for a new \$75,000 County Health Center on February 14 in the City of Santa Monica, which city has affiliated with the County Health Department of Los Angeles County. Dr. William Reasner, formerly associated with the Health Department of Minneapolis has been appointed by Dr. J. L. Pomeroy as Health Officer of the Santa Monica District.

Great interest is being shown throughout Los Angeles County by the announcement that the American Public Health Association is soon to make a survey of the County Health Department under the Efficiency Bureau of Los Angeles County.

Dr. A. S. Baker, Southern California representative, announces that construction of a health center costing approximately \$100,000 for Belvedere district

will soon be commenced. Dr. Baker is Deputy County Health Officer in charge of Belvedere District.

TRAINING PHYSICIANS IN PUBLIC HEALTH

A course of study to train physicians who are about to enter the field of public health is being given at Nashville, Tenn. This course, conducted under the auspices of the Tennessee State Department of Public Health, and the Department of Preventive Medicine of Vanderbilt University School of Medicine, is primarily for the purpose of changing the attitude of a medical practitioner to that of a health officer. In order to make administrative procedure easier, a faculty committee consisting of Drs. W. S. Leathers, E. L. Bishop, W. K. Sharp and Joseph W. Mountin was formed. Dr. Leathers has charge of the work at the university and the field work is being supervised by Dr. Mountin.

They plan to develop habits of systematic research and study, to review clinical subjects pertaining to public health, to demonstrate field methods and to assign the trainee to definite survey projects in order that his ingenuity and resources can be tested.

NEW HAVEN COUNTY PUBLIC HEALTH ASSOCIATION MEETS

THE regular meeting of the New Haven County Public Health Association was held in New Haven, Conn., March 1, 1928. Some of the papers read were:

"Smallpox: Differential Diagnosis and Other Items of Importance," by Dr. Millard Knowlton, Director, Bureau of Preventable Diseases, State Department of Health; "Some of the Important Findings in the Recent Health Survey in New Haven," by Prof. C-E. A. Winslow, Yale University. and "Public

Health Problems of Villages and Rural Districts," by Willis N. Butrick, Health Officer of Milford and Orange, together with Dr. C. N. Denison, Health Officer of Cheshire; Dr. A. S. McQueen, Health Officer of Branford; Dr. S. P. Taylor, Health Officer of North Haven.

DELTA OMEGA LECTURE

THE Delta Omega Lecture on "The Present Status of School Ventilation" at Massachusetts Institute of Technology, Cambridge, Mass., on March 16, 1928, was given by Thomas J. Duffield, Executive Secretary of the New York Commission on Ventilation.

WAR ON SLEEPING SICKNESS

FOR the purpose of consulting with a number of celebrated European specialists who have made studies of sleeping sickness, Dr. Josephine B. Neal, Director of the Wm. J. Matheson Survey of Epidemic Encephalitis, sailed for Europe recently.

Some of the doctors she intends to visit are: Dr. A. J. Hall, Sheffield, England; Dr. J. R. Perdrau, London, England; Dr. Doerr and Dr. Schnabel, Basle, Switzerland and Dr. G. Levaditi at the Pasteur Institute in Paris.

The Medical Center, 17 East 42nd Street, New York, N. Y. hopes to begin a study of the disease, following Dr. Neal's return from Europe.

AMERICAN CITY TO HAVE HEALTH SECTION

BEGINNING with the April issue the *American City Magazine* is to have a section entitled, "The Month in Public Health." This new feature will consist of an original review of public health progress of particular interest to city officials and civic workers. This department will be conducted by James A. Tobey, Dr. P. H.

PERSONALS

- HELEN CHASE, of Waterbury, Conn., has given \$10,000 to the Waterbury Mental Hygiene Clinic to supplement the work now being done there.
- TREAT B. JOHNSON, Ph.D. has been appointed as Sterling professor of chemistry at Yale University, according to an announcement by the President of Yale. Dr. Johnson has been a member of the Yale faculty since 1898, and is noted for his research on the chemistry of bacteria.
- DR. ALVIN H. CRANZ has been appointed physician to the Connecticut State Prison at Wethersfield, to succeed Dr. Percy B. Battey, recently resigned.
- DR. WILLIAM H. MEYER, formerly resident physician at the Williams Hospital, Lebanon, Ind., has been appointed acting assistant surgeon in the U. S. Public Health Service, assigned to duty at U. S. Marine Hospital Number 2, Boston, Mass.
- DR. JAMES H. STYGALL, Indianapolis, Ind., was elected president of the Indiana State Medical Association, at the annual meeting of the association, held at Gary, February 15-16.
- DR. ELMER C. SINGER was appointed a member of the board of health of Fort Wayne, Ind., to succeed Dr. Raymond J. Berghoff, who resigned.
- DR. HENRY S. HOUGHTON, recently appointed dean of the State University of Iowa College of Medicine, assumed his duties at the University Medical School February 1.
- DR. DANIEL C. STEELSMITH, Sibley, Ia., has been appointed deputy state health commissioner, to succeed Dr. James Wallace, who resigned. Dr. Thomas E. Powers has been appointed to succeed Dr. Steelsmith.
- DR. FRANK B. MALLORY was appointed professor of pathology at the Medical School of Harvard University, on February 1, and Dr. Cornelius P. Rhoads was appointed as instructor in pathology.
- DR. BRUNO S. HARWOOD has resigned from the city health department of New York City, after 24 years' service and Dr. William C. Buntin will take over his office temporarily. A testimonial dinner was given to Dr. Harwood on February 6.
- DR. MARION A. BLANKENHORN and Dr. Roy W. Scott have been promoted from associate professors of medicine to professors at Western Reserve University School of Medicine, Columbus, O.
- DR. FRANCIS E. FRONCZAK, has been reëlected by a unanimous vote, health officer of Buffalo, N. Y., where he has been connected with the health department for 17 years.
- DR. CHARLES A. BENZ, superintendent of laboratories in Buffalo, N. Y. has been appointed director of the division of communicable diseases. He will, however, still have charge of the laboratories.
- DR. E. J. JOHNSTON has been appointed city health officer of South Pasadena, Calif., to succeed Dr. John Robert Reid.
- THE CALIFORNIA STATE BOARD OF PUBLIC HEALTH at its meeting on February 4, appointed the following consultants in epidemiology, animal industry, entomology, sanitary engineering, parasitology, bacteriology, pathology, and legal matters pertaining to the Board: Dr. Walter Brem, Dr. Ernest C. Dickson, Dr. C. M. Haring, Prof. W. B. Herms, Prof. C. G. Hyde, Prof. C. A. Kofoid, J. Macfarland, Dr. Karl E. Meyer and Dr. Wm. Ophuls.

DR. E. F. W. ALEXANDERSON, consulting engineer of the General Electric Company and Radio Corporation of America, was presented with the John Ericsson medal at the 40th anniversary banquet of the American Society of Swedish Engineers in New York, February 11. The award was given Dr. Alexanderson "for his outstanding contributions to the field of radio engineering." The medal, founded in honor of the great scientist and engineer, Captain John Ericsson, has been awarded but once before, in 1926, to Dr. Svante Arrhenius, former head of the Nobel Institute and the first man to advance the theory of ionization.

MARIE T. PHELAN of the Federal Children's Bureau who has been loaned to the Texas State Department of Health to assist with the Birth Registration Campaign has just returned to Austin from a field trip, which included Gregg, Dallas, Tarrant and McLellan counties.

DR. I. R. WHIPPER, colored woman physician of the Children's Bureau of Washington, D. C., has been sent to Texas at the request of Dr. J. C. Anderson, State Health Officer of Texas, to do some work with the midwives of the state. It is hoped that in this way the birth registration work and other state requirements will be greatly improved.

DR. A. J. CROWELL has been elected President of the North Carolina State Board of Health to succeed Dr. J. Howell Way.

DR. JAMES R. SCOTT, City Health Officer of Berkeley, Calif., and formerly County Health Officer of Bernalillo County, N. M., will return to New Mexico April 1 to resume his former duties as Bernalillo County Health Officer at Albuquerque.

DOROTHY R. ANDERSON, Chief, Division of Public Health Nursing, New Mexico Bureau of Public Health, is now giving a short course on Health

Education at the New Mexico State Teachers' College, Silver City.

DR. REUBEN L. KAHN, serologist in the Michigan Department of Health, and a member of the Michigan Public Health Association, has been invited to demonstrate the Kahn test for syphilis before the Serological Conference sponsored by the League of Nations Health Section.

DR. JAMES R. SCOTT formerly with the City Health Department of Berkeley, Calif., has become associated with the County Health Department of Albuquerque, N. M.

DR. NATHAN SINAI, associate professor of public health, University of Michigan, has been granted a year's leave of absence to act as Assistant Director of Study with the Committee on the Cost of Medical Care. Dr. Niles Carpenter, head of the sociology department of the University of Buffalo has also been granted a year's leave of absence to accept a similar position with the committee.

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The Current Publications of the A.P.H.A.

A Half Century of Public Health. Edited by MAZYCK P. RAVENEL, M.D. 1921. Pp. 473. De Luxe ed., \$10.00. Special Library Ed., \$5.75.

A history of Public Health in the United States, containing nineteen chapters on every phase of Public Health by noted sanitarians.

Standard Methods for the Examination of Water and Sewage. 6th ed. 1925. Pp. 119. \$2.00.

Physical and Chemical Examination of Water and Sewage, Microscopical Examination of Water and Bacteriological Examination of Water.

Standard Methods of Milk Analysis. 5th ed. 1927. Pp. 55. 50c. French ed., 50c.

Bacteriological and Chemical Methods of Analysis compiled by the American Public Health Association and the Association of Official Agricultural Chemists.

Standard Methods for the Examination of Water and Sewage and Standard Methods of Milk Analysis in one volume, \$2.25.

Community Health Organization. Edited by IRA V. HISCOCK. 1927. Pp. 122. \$2.00.

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Bibliography on Public Health and Allied Topics, 1927. Pp. 16.

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American Journal of Public Health

and THE NATION'S HEALTH VOL. X NO. 5

Volume XVIII

May, 1928

Number 5

The Behavior of Lead in The Animal Organism-I*

ROBERT A. KEHOE, M. D. and FREDERICK THAMANN

Eichberg Laboratory of Physiology, University of Cincinnati, Cincinnati, O.

THE MOST difficult problem in the prevention of industrial lead poisoning arises from the variability in the effect of a given set of conditions upon workmen. The comparatively low toxicity of lead for most men has retarded a general appreciation of the necessity for adequate preventive measures. On the other hand, the remarkable susceptibility to lead of an occasional man has brought about such a state of clinical confusion, that the diagnosis of lead poisoning is often made on the uncertain basis of a history of actual or even presumable exposure to lead compounds. Furthermore, the same individual reacts differently to the same degree of exposure at different times. Thus some individuals apparently develop a degree of immunity to the effects of lead absorption after a period of exposure. The reverse condition—the sudden onset of poisoning in a person of apparently little previous susceptibility—is of more frequent occurrence.

Many attempts have been made to determine the nature of so variable a disease. The collected data illustrate the lack of uniformity in the manifestations of the condition. Animal experimentation has shown that different species of animals, and different individuals of the same species, vary greatly in susceptibility to lead and in the type of induced poisoning which results. There is also great variability in the rate of absorption, and in the rate of excretion in different animals and in the same animal under different conditions.

The foregoing facts indicate that the behavior of lead in the animal organism is subject to a large number of modifying influences. An

* Read before the Industrial Hygiene Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 21, 1927.

understanding of these requires a knowledge of the detailed behavior of lead in the body under a great variety of conditions.

The most fruitful attempt to bring together experimental and clinical data, to investigate them critically, and to discover an underlying mechanism capable of explaining many confusing and apparently conflicting facts, has been made by Aub and his associates.¹ Their presentation of conclusive evidence of the selective localization of lead in the bones, and the passage of lead out of the bones and out of the body under proper conditions, has resulted in important and advantageous therapeutic measures. However, their interpretation of the mechanisms of selective absorption and mobilization of lead in the body does not explain adequately certain clinical and experimental facts. Furthermore, we still require a knowledge as to the nature of the action whereby lead and the other heavy metals cause injury to the living tissues. It becomes necessary, therefore, to investigate further and in greater detail.

Facts presented herein are based on the following selected items of an extensive experimental program: (1) a study of the distribution of lead in a series of rabbits under uniform conditions, in order to determine the limits of variation for one set of conditions; (2) a comparison of the standard type of distribution thus obtained, with the distribution in animals in which lead has been administered differently and which have been given a very much longer time interval after treatment; (3) a study of the excretion of lead in rabbits under normal conditions, a long time after treatment with lead.

EXPERIMENTAL METHODS

1. Preliminary experiments studying the distribution of lead in animals treated with lead compounds showed a considerable variation. Certain gross variations appeared to be explained by some outstanding factor, such as type of lead compound administered, acute infection, parturition, inadequate diet, or the influence of administered acids and salts.² In order to determine a standard type of distribution, a group of 20 full grown rabbits, 10 males and 10 females, were selected because of their similarity in size, age and condition. These were isolated from other animals and from each other in cages in a well lighted, well ventilated room. They were all fed on a standard, mixed diet. Observation was continued 3 weeks to insure against pregnancy in the females and illness in any member of the group. Each animal was given 50 mg. of lead per week in one dose as a solution of lead chloride, for 4 weeks, by means of a stomach tube.

Ten animals developed respiratory infections, varying from slight snuffles to pneumonia, during a period of extreme changes in the weather. The remainder remained well during the entire period. Four of the sick animals died, the other 6 showed some evidence of low grade infection up to the conclusion of the experiment, and at necropsy. These were all localized head infections, without evidence of systemic intoxication.

After the fourth dose an interval of 2 weeks was allowed in order that the alimentary tract might free itself of unabsorbed administered lead. Then, under light anesthesia the blood was drawn off from the heart, slowly and steadily by means of a syringe, until death resulted. This permitted the obtaining of a large quantity of blood for analysis and in addition freed the tissues largely of their blood. The skin was removed with great care not to contaminate the underlying tissues, and discarded. The other tissues were separated cleanly as follows: bone, liver, kidneys, central nervous system (brain and spinal cord), spleen, muscle, adipose tissue, and intestinal tract (washed free of its contents). In the case of several animals the hair on the sides and back which was least likely to be contaminated at any time with feces or urine, was clipped off for separate analysis.

2. In order to determine whether the method of administration and time alter relative distribution of lead in the tissues a number of rabbits which had been given lead, but which had received none for months, were killed and their tissues were examined similarly. All of these had been given lead intravenously. No other recognizable factor was present, except time, however, for great care was used to include only such animals as were perfectly healthy, and which had received no treatment of any kind beyond the administration of water soluble salts of lead.

3. A large series of rabbits has been studied with reference to the excretion of lead under a variety of natural and experimentally induced conditions. The rate of excretion is found to vary strikingly with some of these conditions. The same factors which apparently modify the distribution of lead in the tissues, also alter the rate of excretion.³ There is, in addition, a striking variation from day to day, dependent upon the amount of food eaten, the amount of water consumed, and the actual amount of excreta. Therefore, it is most important in a study of excretion under normal conditions, not to use animals which are ill in any way, or which have been exposed to any of the recognizable influences which change the distribution of lead in their tissues. It is equally necessary to collect the excreta over a period of time sufficient to equalize the daily variation. Four immediately successive periods of 4 full days each were chosen for this purpose. The average daily excretion was calculated on this basis. Great caution had to be used also in preventing contamination of the excreta with lead from sources other than that intended. Thirteen rabbits carefully selected in this way have supplied the data for this item of the study. They were killed for analysis at the conclusion of the last period over which their excretions were collected. No pathological abnormality was found in any of these at necropsy.

DATA AND DISCUSSION

Table I shows all the analytical data obtained from the group of rabbits treated in the standard manner. A careful examination of the analytical method in use at the time of these analyses has shown an inconstant but possible experimental error of $+0.03$ mg. of lead. This error has recently been eliminated by a slight modification of technic, but such quantities may not be considered as certainly significant in these data. Therefore, no calculations or conclusions are based on them. All other quantities are used as the basis for the calculation of the concentration of lead in the particular organ. In order to com-

TABLE I
DISTRIBUTION OF LEAD IN RABBITS (Oral Administration)

Tissue	6 1/4 lbs. Doe Rabbit 212			7 lbs. Doe Rabbit 213			5 lbs. Buck Rabbit 214		
	Mgs.	Mgs.%	Index	Mgs.	Mgs.%	Index	Mgs.	Mgs.%	Index
1. Kidneys	0.03			Nil	Nil	Nil	0.03		
2. Liver	0.10	0.143	0.68	0.08	0.084	1.09	0.08	0.116	0.59
3. Spleen	Nil	Nil	Nil	0.23	15.333	199.20	0.01		
4. Central Nervous System	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
5. Blood	0.06	0.137	0.65	0.02			0.04	0.076	0.38
6. Adipose Tissue	0.12	0.110	0.52	0.07	0.058	0.75	Nil	Nil	Nil
7. Muscle and Connective Tissue	0.17	0.019	0.09	0.34	0.030	0.39	0.15	0.018	0.09
8. Bone	2.85	1.006	4.75	0.70	0.275	3.58	2.50	0.980	4.95
9. Intestinal Tract (Washed free of contents)	0.06	0.035	0.17	0.03			0.02		
10. Hair	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Total	3.39	0.212	1.00	1.47	0.077	1.00	2.83	0.198	1.00

Tissue	5 14/16 lbs. Buck Rabbit 215			5 10/16 lbs. Buck Rabbit 216			5 14/16 lbs. Buck Rabbit 217		
	Mgs.	Mgs.%	Index	Mgs.	Mgs.%	Index	Mgs.	Mgs.%	Index
1. Kidneys	0.01			Nil	Nil	Nil	0.02		
2. Liver	0.06	0.091	0.58	0.06	0.071	0.95	0.24	0.231	1.02
3. Spleen	Nil	Nil	Nil	0.04	2.000	26.67	0.04	2.667	11.70
4. Central Nervous System	0.01			0.08	0.615	8.15	0.22	1.571	6.89
5. Blood	0.22	0.259	1.66	0.01			0.02		
6. Adipose Tissue	0.07	0.212	1.36	0.02			0.03		
7. Muscle and Connective Tissue	Nil	Nil	Nil	0.26	0.024	0.32	0.16	0.015	0.07
8. Bone	2.25	1.325	8.50	0.79	0.348	4.64	3.12	1.374	6.03
9. Intestinal Tract (Washed free of contents)	0.03			0.02			0.12	0.055	0.37
10. Hair	Thrown away			Thrown away			Thrown away		
Total	2.65	0.156	1.00	1.29	0.075	1.00	3.97	0.228	1.00

Tissue	6 1/16 lbs. Buck Rabbit 221			6 7/16 lbs. Buck Rabbit 223			6 7/16 lbs. Buck Rabbit 224		
	Mgs.	Mgs.%	Index	Mgs.	Mgs.%	Index	Mgs.	Mgs.%	Index
1. Kidneys	0.02			0.02			0.01		
2. Liver	0.05	0.068	0.89	0.06	0.073	0.64	0.20	0.250	1.35
3. Spleen	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
4. Central Nervous System	0.05	0.333	4.38	0.01			0.03		
5. Blood	Nil	Nil	Nil	0.02			0.06	0.120	0.65
6. Adipose Tissue	0.05	0.122	1.61	0.03			0.14	0.014	0.08
7. Muscle and Connective Tissue	0.19	0.019	0.25	0.14	0.013	0.12	0.14	0.014	0.08
8. Bone	0.93	0.327	4.26	1.65	0.829	4.17	2.40	1.057	5.71
9. Intestinal Tract (Washed free of contents)	0.01			0.04	0.020	0.18	0.10	0.070	0.38
10. Hair	Thrown away			Thrown away			Thrown away		
Total	1.30	0.076	1.00	1.97	0.114	1.00	2.97	0.185	1.00

Tissue	5 2/16 lbs. Buck Rabbit 225			7 5/16 lbs. Doe Rabbit 226			5 7/16 lbs. Doe Rabbit 227		
	Mgs.	Mgs.%	Index	Mgs.	Mgs.%	Index	Mgs.	Mgs.%	Index
1. Kidneys	0.01			0.01			Nil	Nil	Nil
2. Liver	0.10	0.108	1.23	0.11	0.090	0.95	0.08	0.032	0.90
3. Spleen	Nil	Nil	Nil	0.01			Nil	Nil	Nil
4. Central Nervous System	Nil	Nil	Nil	0.01			Nil	Nil	Nil
5. Blood	Nil	Nil	Nil	0.02			Nil	Nil	Nil
6. Adipose Tissue	0.10	0.147	1.67	0.07	0.031	0.33	0.05	0.185	2.03
7. Muscle and Connective Tissue	0.22	0.024	0.27	0.22	0.016	0.17	0.07	0.005	0.06
8. Bone	0.87	0.437	4.97	1.74	0.767	8.07	1.58	0.557	6.12
9. Intestinal Tract (Washed free of contents)	0.03			0.02			0.07	0.035	0.38
10. Hair	Thrown away			Thrown away			Thrown away		
Total	1.33	0.088	1.00	2.21	0.095	1.00	1.85	0.091	1.00

TABLE I (Cont.)

DISTRIBUTION OF LEAD IN RABBITS (Oral Administration)

Tissue	5 9/16 lbs. Doe Rabbit 228			6 13/16 lbs. Doe Rabbit 229			5 13/16 lbs. Doe Rabbit 230		
	Mgs.	Mgs. %	Index	Mgs.	Mgs. %	Index	Mgs.	Mgs. %	Index
1. Kidneys	0.03			Nil	Nil	Nil	Nil	Nil	Nil
2. Liver	0.05	0.060	3.33	0.04	0.062	0.47	0.18	0.188	0.72
3. Spleen	Nil	Nil	Nil	0.01			0.17	8.500	32.44
4. Central Nervous System	Nil	Nil	Nil	0.02			Nil	Nil	Nil
5. Blood	0.05	0.049	2.72	Nil	Nil	Nil	0.10	0.175	0.67
6. Adipose Tissue	0.07	0.029	1.61	0.08	0.054	0.41	0.15	0.125	0.48
7. Muscle and Connective Tissue	0.10	0.009	0.50	0.14	0.016	0.12	0.28	0.031	0.12
8. Bone	0.05	0.025	1.39	1.77	0.780	5.95	3.00	1.322	5.05
9. Intestinal Tract (Washed free of contents)	Nil	Nil	Nil	0.03			0.53	0.208	0.79
10. Hair	Thrown away			Thrown away			Thrown away		
Total	0.35	0.018	1.00	2.09	0.131	1.00	4.41	0.262	1.00

Tissue	6 lbs. Doe Rabbit 231			Average 8 Bucks 8 Does		
	Mgs.	Mgs. %	Index	Mgs.	Mgs. %	Index
1. Kidneys	Nil	Nil	Nil	0.02		
2. Liver	0.09	0.101	1.53	0.10	0.117	0.94
3. Spleen	Nil	Nil	Nil			
4. Central Nervous System	0.05	0.385	5.83	0.02		
5. Blood	0.03			0.03		
6. Adipose Tissue	0.18	0.073	1.11	0.04	0.053	0.43
7. Muscle and Connective Tissue	0.28	0.023	0.35	0.07	0.067	0.54
8. Bone	0.77	0.302	4.58	0.16	0.015	0.12
9. Intestinal Tract (Washed free of contents)	0.02			1.69	0.722	5.82
10. Hair	Thrown away			0.07	0.039	0.32
Total	1.42	0.066	1.00	2.20	0.124	

TABLE II

STANDARD TYPE OF DISTRIBUTION OF LEAD IN RABBITS (Oral Administration)

Animal Number	Normal								
	Kidneys	Liver	Spleen	Blood	Bone	C.N.S.	Fat	Muscle	G.I.T.
213	Nil	1.09	199.2	Nil?	3.58	Nil	0.75	0.39	Nil?
215	Nil?	0.58	Nil	1.66	8.50	Nil?	1.36	Nil	Nil?
216	Nil	0.95	26.67	Nil?	4.64	8.15	Nil?	0.32	Nil?
221	Nil?	0.89	Nil	Nil	4.26	4.38	1.61	0.25	Nil?
226	Nil?	0.95	Nil?	Nil?	8.07	Nil?	0.33	0.17	Nil?
225	Nil?	1.23	Nil	Nil	4.97	Nil	1.67	0.27	Nil?
228	Nil?	3.33	Nil	2.72	1.39	Nil	1.61	0.50	Nil
229	Nil	0.47	Nil?	Nil	5.95	Nil?	0.41	0.12	Nil?
230	Nil	0.72	32.44	0.67	5.05	Nil	0.48	0.12	0.79
231	Nil	1.53	Nil	Nil?	4.58	5.83	1.11	0.35	Nil?
	Infected								
	Kidneys	Liver	Spleen	Blood	Bone	C.N.S.	Fat	Muscle	G.I.T.
212	Nil?	0.68	Nil	0.65	4.75	Nil	0.52	0.09	0.17
214	Nil?	0.59	Nil?	0.38	4.95	Nil	Nil	0.09	Nil?
217	Nil?	1.02	11.70	Nil?	6.03	6.89	Nil?	0.07	0.37
223	Nil?	0.64	Nil	Nil?	4.17	Nil?	0.43	0.12	0.18
224	Nil?	1.35	Nil	Nil?	5.71	Nil?	0.65	0.08	0.38
227	Nil	0.90	Nil	Nil	6.12	Nil	2.03	0.06	0.38
Calculated Mean		1.047			5.563		0.844	0.194	
Standard Deviation \pm		0.677			1.197		0.630	0.141	

pare the distribution of lead where the total lead content of the animal varies, calculation has been made of what may be called an "index of selective absorption." This is recorded as the ratio existing between the concentration of lead in the entire carcass, exclusive of the skin, in milligrams per cent, and the concentration of lead in a tissue in milligrams per cent.

Table II illustrates the distribution in these animals with reference to the indices of selective absorption only. The results which are in doubt because of their smallness, as considered against the possible experimental error, are marked "nil?" The infected animals are separated from the others in the table because of the possible influence of their illness on distribution. However, there is no appreciable effect of this factor on the results so that they are included in the calculation of the mean values of the absorption "index." It is not possible to calculate these values for all the tissues concerned both because of the doubtful character of the low results and also because of their variability. In the case of the liver, bone, fat and muscle, however, these values may be calculated with assurance as to the accuracy of the analytical results. The calculated mean and the standard deviation from it are indicated in the table.

A number of significant things are seen in the tabulated data. First of all the quantities of lead found in the entire animals (from 1 to 3 mg.) represent only a very small fraction of the lead administered. There is reason to believe that the method of disposing of the organic material of the tissues (ashing in an electric furnace at a temperature carefully controlled so as not to exceed 500° C.) brings about a slight loss of the lead by volatilization.⁴ (This fact probably indicates the formation of compounds of the lead with organic constituents of the tissues.) This loss is never more than a small fraction of the lead present, however, so that it may not be considered as of significance to the present matter. The low lead content of these animals is due to incomplete absorption of the administered lead, or to rapid elimination of that absorbed, or to a combination of both. Examination of data bearing on these two points indicates the probability that not more than 10 per cent of the administered lead was absorbed into the tissues, and that continuous excretion has accounted for the loss of from 50 to 80 per cent of that absorbed.⁵

Although the blood uniformly contains little or no lead, the liver, the adipose tissue, and the muscles, in addition to the bones, contain significant quantities. There is, therefore, an unquestionable selective affinity for lead on the part of all of these tissues. This may or may not be due to some common factor in their physical or chemical char-

acter. In either case their lead binding power differs quantitatively. Other tissues in the body may have similar affinities for lead. Thus an organ may be so small that its lead content is not capable of accurate determination; or its location along the circulatory system, with reference to the portal of entry may be such as to diminish its opportunity

TABLE III
DISTRIBUTION OF LEAD IN RABBITS—TIME FACTOR (Intravenous Administration)

Rabbit Number	171			172			176		
	Mgs.	Mgs.%	Index	Mgs.	Mgs.%	Index	Mgs.	Mgs.%	Index
Kidneys	?								
Liver	0.03			0.04	0.286	2.55	0.08	0.80	17.78
	0.19	0.211	1.76	0.08	0.093	0.83	Nil		
Spleen	Nil			?			Nil		
				0.02			?		
C. N. S.	Nil			0.11	0.785	7.01	0.01		
	?			?			?		
Blood	0.02			0.03			Nil		
	?								
Fat	0.02			0.06	0.056	0.50	0.05	0.012	0.27
Muscle	0.35	0.046	0.38	0.06	0.008	0.07	0.05	0.005	0.11
Bone	1.11	0.489	4.07	1.05	0.463	4.13	0.71	0.313	6.96
G. I. T.	0.04	0.024	0.20	0.12	0.085	0.76	Nil		
Total	1.76	0.120	1	1.57	0.112	1	0.90	0.045	1
Dosage	20 Mgs. Intravenously			20 Mgs. Intravenously			35 Mgs. Intravenously		
Time	5 months			5 months			9 months		
Rabbit Number	186			203			205		
	Mgs.	Mgs.%	Index	Mgs.	Mgs.%	Index	Mgs.	Mgs.%	Index
Kidneys	Nil			0.05	0.384	3.62	0.20	1.818	30.30
							?		
Liver	0.08	0.104	0.50	0.13	0.106	1.00	0.03		
				?					
Spleen	Nil			0.03			0.04	4.00	66.67
							?		
C. N. S.	Nil			0.12	1.00	9.43	0.03		
	?								
Blood	0.03			0.04	0.044	0.42	0.06	0.090	1.50
	?						?		
Fat	0.03			0.18	0.033	0.31	0.01		
Muscle	0.24	0.022	0.11	0.21	0.017	0.16	0.05	0.006	0.10
Bone	3.40	1.498	7.27	1.71	0.753	7.10	0.37	0.185	3.10
	?						?		
G. I. T.	0.01			0.06	0.035	0.33	0.03		
Total	3.79	0.206	1.	2.53	0.106	1	0.82	0.060	1
Dosage	40 Mgs. Intravenously			60 Mgs. Intravenously			60 Mgs. Intravenously		
Time	9 months			6 months			6 months		
Rabbit Number	206			175			180		
	Mgs.	Mgs.%	Index	Mgs.	Mgs.%	Index	Mgs.	Mgs.%	Index
Kidneys	0.35	2.92	6.47	Nil			?		
Liver	0.37	0.493	1.09	Nil			0.02		
Spleen	0.09	3.00	6.65	Nil			0.40	0.635	4.56
C. N. S.	0.09	0.692	1.53	Nil			Nil		
	?						Nil		
Blood	0.03			Nil			Nil		
				?					
Fat	0.33	0.943	2.09	0.03			0.09	0.041	0.29
Muscle	0.12	0.017	0.04	0.11	0.01	0.12	0.09	0.011	0.08
Bone	4.24	2.50	5.54	1.48	0.652	7.50	1.59	0.701	5.04
				?					
G. I. T.	0.04	0.020	0.04	0.03			Nil		
Total	5.66	0.451	1	1.65	0.087	1	2.19	0.139	1
Dosage	60 Mgs. Intravenously			20 Mgs. Intravenously			80 Mgs. Intravenously		
Time	3 months			10 months			10 months		

TABLE IV

DISTRIBUTION OF LEAD IN RABBITS—TIME EFFECT (Intravenous Administration)

Animal Number	Kidneys	Liver	Spleen	Blood	Bone	C.N.S.	Fat	Muscle	G.I.T.
171	Nil?	1.76	Nil	Nil	4.07	Nil?	Nil?	0.38	0.20
172	2.55	0.83	Nil?	Nil?	4.13	7.01	0.50	0.07	0.76
176	17.78	Nil	Nil	Nil	6.96	Nil?	0.27	0.11	Nil
186	Nil	0.50	Nil	Nil?	7.27	Nil?	Nil?	0.11	Nil?
203	3.62	1.00	Nil?	0.42	7.10	9.43	0.31	0.16	0.33
205	30.30	Nil?	66.67	1.50	3.10	Nil?	Nil?	0.10	Nil?
206	6.47	1.09	6.65	Nil?	5.54	1.53	2.09	0.04	0.04
175	Nil	Nil	Nil	Nil	7.50	Nil	Nil?	0.12	Nil?
180	Nil?	4.56	Nil	Nil	5.04	Nil	0.29	0.08	Nil
Calculated Mean		1.181			5.833		.506	.142	
Standard Deviation \pm		1.335			1.415		.636	.088	

for contact with the blood at a time when it contains high concentrations of lead. This latter factor may be tested by comparing the distribution of lead in the tissues of animals which have received lead in different ways.

Thus Tables III and IV show the effect of intravenous administration of lead upon its distribution in a series of animals. A very long time has elapsed since the administration, during which a very large proportion of the lead has been lost from the body. Yet two things are discernible. There is an increased frequency in the occurrence of significant quantities of lead in tissues other than the bones, liver, adipose tissue and muscle, without corresponding concentrations of lead in the circulating blood. The concentrations in certain tissues may be of a magnitude comparable with that of the bone. This is especially true of the kidneys and the central nervous system. There is a strong probability, therefore, that these tissues have a considerable affinity or combining power for lead, if they have an opportunity to come in contact with adequate concentrations brought by the circulating blood. There is little doubt that the chances of such an occurrence are very much greater if lead is administered intravenously, rather than by way of the alimentary tract. In the latter case, there is ample reason to believe that the liver is normally capable of preventing the appearance of high concentrations of lead in the blood.

The question naturally arises as to whether the lead is bound in all these tissues in the same manner, or whether it may not be firmly bound or stored in inert form in some, while being in less stable combinations in others. It is quite suggestive, in this connection, that despite the loss of 90 per cent or more of their total lead, the relative distribution of lead in the bones, liver, adipose tissue and muscle remains essentially unchanged. Undoubtedly the greatest quantity of the lead lost from the body was removed from the bones. There are three ways in which the relative distribution can remain thus constant. The lead may have been lost rapidly from certain organs with

little relative affinity for it, and subsequently replaced by lead which was released from others in some intermittent normal or accidental manner; or all the tissues may have given up their lead at a rate varying only with the differences in their lead concentrations; or the process of elimination may have been intermittent for all of the tissues, as a result of some naturally or accidentally occurring condition,

TABLE V
RELATION OF EXCRETION TO QUANTITY IN BODY

Rabbit Number	Lead Administered			Intervening time in months	Average Daily Excretion Mgs.	Lead in Carcass Mgs.	Excretion Mgs. Daily/ Mgs. in Body
	Manner	Doses	Amount Mgs.				
135	1	1	10	6	0.050	1.22	0.041
104	0	33	330	0.5	0.055	1.29	0.043
172	1	1	20	5	0.121	1.57	0.077
174	1	1	25	10	0.045	1.65	0.027
175	1	1	20	10	0.031	1.65	0.019
136	1	1	20	12	0.034	1.72	0.020
171	1	1	20	5	0.011	1.76	0.006
180	1	2	80	10	0.066	2.19	0.030
194	1	1	40	9	0.016	2.35	0.007
198	0	4	600	6	0.022	3.75	0.005
206	1	4	60	3	0.120	5.66	0.021
199	0	4	600	6	0.165	6.07	0.027
200	0	4	600	6	0.160	13.61	0.012

capable of simultaneous modification of all the mechanisms whereby lead is held in the tissues.

In any case, it is plain that in the case of rabbits, under apparently normal conditions, lead is capable of steady excretion from all the tissues on which these data supply information. (Other data demonstrate a remarkable ability of central nervous system to retain lead, almost quantitatively.⁶)

The same point is illustrated by the data in Table V. Here excretion of lead, under normal conditions shows a strikingly frequent dependence upon the total lead content of the animal. Considering individual variation, and the probabilities for the existence of unrecognized factors in the underlying processes of lead mobilization and excretion, there is a notable degree of uniformity. Therefore, one may conclude that the rate of lead excretion varies generally with the quantity of lead in the entire body. It is difficult to understand in any other way the uniformly small proportion of the administered lead remaining in these animals. The loss of from 10 to almost 80 mg. of lead in 6 or 8 months cannot be explained on the basis of the rate of excretion found at the time of these observations. Lead must have been poured out at a much more rapid rate in the periods following shortly after administration. If the truth of this reasoning be accepted, then the lead in all of the tissues is influenced by the same set of reactions in the body, or by varying reactions in different tissues operating simultaneously or in close succession.

These considerations lead to the belief that lead is not converted quantitatively in the body to the relatively insoluble inorganic secondary and tertiary phosphates.⁷⁻⁹ Speculation as to a mechanism capable of explaining the experimental facts suggest that a significant portion of the lead in the body exists in the form of compounds or complexes with organic constituents of the tissues. To the extent to which inorganic tertiary and secondary phosphates are present, an equilibrium may exist between them and such organic compounds—an equilibrium constantly shifting by reason of the conversion of the organic compounds into the forms in which lead is excreted.

PRACTICAL APPLICATIONS

The application of the observed facts to clinical and industrial practice may be briefly suggested. Data obtained on a large number of cases of lead absorption in man, give evidence that both fecal and urinary lead excretion in man vary in quantity with the extent and severity of exposure to lead compounds.⁹ This provides indirect evidence that the quantitative factor in such excretion is based upon the quantity of lead in the body of the subject. It also indicates a probability that the conditions which influence the absorption and excretion of lead in the normal man are similar to those in the rabbit. Direct evidence in this matter will be difficult if not impossible to obtain. If such tentative conclusions are correct, however, it should be possible to determine the approximate lead content of a given subject by a careful study of his lead excretion over a sufficient period of time, during which no known factor is allowed to modify the normal rate. It may also be possible to determine the relationship of a given rate of excretion of lead to the appearance of symptoms.

Furthermore, if lead excretion varies with exposure, it becomes possible by studying a sufficient number of men in this way to measure adequately the lead hazards associated with various occupations. Such a method provides a check on the adequacy of all the preventive measures used to control a given hazard, including the extremely variable and undependable element of carefulness on the part of the workers. The usefulness of such information, capable of interpretation on a sound basis, is obvious, both in the domain of industrial preventive medicine, and in the larger field of the public health.

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Accuracy of Certified Causes of Death*

SINCE our report of a year ago before this section, your Committee on Accuracy of Certified Causes of Death has had several meetings and two members of the committee have, at the request of the League of Nations, represented American opinion in this field at a conference of statistical experts in Geneva, and have presented formally to the special committee of the International Institute of Statistics, their point of view prior to the conference held in Paris, in April, 1927.

The Health Section of the League of Nations assembled a small group of medical registrars, statistical officers and physicians, to consider preliminary revision of the International List. The result of this conference was the preparation of an intermediate list of 90 titles, as well as the revision of the abridged list to include only 27 titles. These lists were published in the September issue of the *American Journal of Public Health*.

At the meeting of the Committee of the International Institute of Statistics in Paris, consideration of the revision of the International Lists was continued in much the same spirit, and by several of the same persons who attended the Geneva conference, with the result that three revised lists have been prepared for presentation at the meeting of the International Institute at Cairo in December of this year. These lists also have been published in the September *American Journal of Public Health*.

Your committee is of the opinion that the issuance of three international lists is desirable; a detailed list of approximately 200 titles; an intermediate list of approximately 90 titles; and an abridged list of something over 30 titles.

Since the two meetings in Europe above referred to, your committee has again considered all the facts at hand, and in its present report offers you three lists which are designed to preserve comparability, and recommends your approval of them as the expression of American opinion, to be forwarded to both the Health Section of the League of Nations and the International Institute of Statistics, in response to their formal requests.

Other countries have in preparation similar revisions, and it is expected that further conferences under international and scientific

* Report of the Committee on the Accuracy of Certified Causes of Death and Its relation to Mortality Statistics and the International Classification. (Adopted by the Vital Statistics Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 19, 1927.)

auspices will be held between now and 1929, when the French Government will convoke the International Conference in Paris which will decide the final revision of the International Lists as of the year 1930.

All these preliminary conferences are, in the opinion of your committee, desirable and necessary for the purpose of reaching the greatest possible agreement as to principles and practices before the final conference of 1929. It is the opinion of your committee that very considerable improvement has been attained in the terms used, in the groups under which the terms are assembled, and in the addition of an intermediate list to the detailed and abridged lists of causes of death already in use.

In the preparation of the three revised lists as offered for your consideration, the factors of greatest importance (after scientific accuracy in terminology) in determining acceptance or rejection of suggestions for changes, coming from other countries, or originating from American statisticians, have been the preservation of comparability with past records, and the facilitating of a wider use of the International List than has been obtained up to the present time.

The committee voted to include as a part of its own report that of the committee on Joint Causes of Death. This appeared in the February, 1928, issue of the *American Journal of Public Health*, and *The Nation's Health*, and need not be repeated here.

The following are the lists recommended by your committee. The numbers in parentheses in the Intermediate and Abridged lists refer to the titles of the Detailed list which are included.

REVISED LISTS

A. DETAILED LIST

- | | |
|-------------------------------------|--|
| 1. Typhoid and paratyphoid fever | 12. Cholera nostras |
| (a) Typhoid fever | 13. Dysentery |
| (b) Paratyphoid fever | (a) Amebic |
| 2. Typhus fever | (b) Bacillary |
| 3. Malta fever | (c) Unspecified or due to other causes |
| 4. Small-pox | 14. Plague |
| 5. Measles | (a) bubonic |
| 6. Scarlet fever | (b) pneumonic |
| 7. Whooping cough | (c) septicemic |
| 8. Diphtheria | (d) unspecified |
| 9. Influenza | 15. Erysipelas |
| (a) with pulmonary complications | 16. Acute anterior poliomyelitis |
| specified | 17. Lethargic encephalitis |
| (b) without pulmonary complications | 18. Meningococcus meningitis |
| specified | 19. Glanders |
| 10. Mumps | 20. Anthrax |
| 11. Asiatic cholera | 21. Rabies |
| | 22. Tetanus |
| | 23. Tuberculosis of the respiratory system |

24. Tuberculosis of the meninges and central nervous system
25. Tuberculosis of the intestines and peritoneum
26. Tuberculosis of the vertebral column
27. Tuberculosis of the bones and joints (vertebral column excepted)
 - (a) bones
 - (b) joints
28. Tuberculosis of other organs
 - (a) Tuberculosis of the skin and subcutaneous tissue
 - (b) Tuberculosis of the lymphatic system (mesenteric and retroperitoneal glands excepted)
 - (c) Tuberculosis of the genitourinary system
 - (d) Tuberculosis of organs other than above
29. Disseminated tuberculosis
 - (a) Acute
 - (b) Chronic or unspecified
30. Leprosy
31. Syphilis
 - (a) Congenital
 - (b) Acquired
 - (c) Unspecified
32. Gonococcus infection
33. Purulent infection, septicemia (including pyemia and bacteriemia).
34. Malaria
 - (a) Malarial fever
 - (b) Malarial cachexia
35. Relapsing fever (*spirillum obermeieri*)
36. Yellow fever
37. Spirochetal hemorrhagic jaundice
38. Other spirochetoses
39. Ancylostomiasis
40. Hydatid cyst
 - (a) of the liver
 - (b) of other organs or tissue
41. Other diseases due to animal parasites
42. Mycoses
43. Other epidemic, endemic, infectious, and parasitic diseases*
*Diseases of unusual prevalence should be separately tabulated.
44. Cancer and other malignant tumors of the buccal cavity
45. Cancer and other malignant tumors of the pharynx, esophagus, stomach, liver
46. Cancer and other malignant tumors of the peritoneum, intestines, rectum
47. Cancer and other malignant tumors of the female genital organs
48. Cancer and other malignant tumors of the breast
49. Cancer and other malignant tumors of the skin
50. Cancer and other malignant tumors of other or unspecified organs
51. Benign tumors and tumors not returned as malignant (without exception)*
*Subdivide by at least ten subtitles by anatomical site.
52. Acute rheumatic fever
53. Chronic rheumatism, osteoarthritis, gout
 - (a) Gout
 - (b) Others under this title
54. Scurvy
55. Pellagra
56. Beriberi
57. Rickets and other softenings of the bones
 - (a) Rickets
 - (b) Other softenings of the bones
58. Diabetes mellitus
59. Anemia, pernicious and other
 - (a) Pernicious anemia
 - (b) Other anemias and chlorosis
60. Leukemia and Hodgkin's disease
 - (a) Leukemia
 - (b) Hodgkin's disease
61. Diseases of the pituitary gland
62. Diseases of the thyroid gland
 - (a) Exophthalmic goiter
 - (b) Other diseases of the thyroid gland
63. Diseases of the parathyroid glands
64. Diseases of the thymus gland
65. Diseases of the adrenal glands or capsules (Addison's disease)
66. Diseases of the spleen
67. Alcoholism (acute or chronic)*
*Acute poisoning by methyl or denatured alcohol excluded; see 180
68. Chronic lead poisoning
69. Other chronic occupational poisonings
70. Other chronic poisonings
71. Other general diseases
72. Encephalitis
73. Meningitis
74. Tabes dorsalis (locomotor ataxia)
75. Other diseases of the spinal cord
76. Cerebral hemorrhage, apoplexy
 - (a) Cerebral hemorrhage
 - (b) Cerebral embolism and thrombosis
77. Paralysis without specified cause
 - (a) Hemiplegia
 - (b) Others under this title
78. General paralysis of the insane
79. Other forms of mental alienation
80. Epilepsy
81. Convulsions (nonpuerperal; 5 years and over)
82. Infantile convulsions (under 5 years of age)
83. Chorea
84. Neuralgia and neuritis
85. Other diseases of the nervous system
 - (a) Softening of the brain

- (b) Other diseases of the nervous system
- 86. Diseases of the eye and annexa
- 87. Diseases of the ear and of the mastoid process
 - (a) Diseases of the ear
 - (b) Diseases of the mastoid
- 88. Pericarditis
 - (a) Acute and unspecified
 - (b) Chronic
- 89. Endocarditis and myocarditis (acute)
- 90. Chronic endocarditis and valvular diseases of the heart
- 91. Angina pectoris
- 92. Other and unspecified diseases of the heart
 - (a) Chronic myocarditis
 - (b) Functional diseases of the heart
 - (c) Other and unspecified diseases of the heart
- 93. Aneurysm
- 94. Arteriosclerosis and other diseases of the arteries
 - (a) Arteriosclerosis
 - (b) Other diseases of the arteries
- 95. Embolism and thrombosis (cerebral and pulmonary excepted)
- 96. Diseases of the veins (varices, hemorrhoids, phlebitis, etc.)
- 97. Diseases of the lymphatic system, (lymphangitis, etc.)
- 98. Hemorrhage without specified cause
- 99. Other diseases of the circulatory system
- 100. Diseases of the nasal fossae and their annexa
- 101. Diseases of the larynx
- 102. Bronchitis
 - (a) acute
 - (b) chronic
 - (c) unspecified (under 5 years of age)
 - (d) unspecified (5 years and over)
- 103. Bronchopneumonia (includes capillary bronchitis)
- 104. Pneumonia, lobar and unspecified
 - (a) lobar
 - (b) unspecified
- 105. Pleurisy
- 106. Congestion, embolism, and hemorrhagic infarct of the lung
- 107. Gangrene of the lung
- 108. Asthma
- 109. Pulmonary emphysema
- 110. Other diseases of the respiratory system (tuberculosis excepted)
 - (a) Chronic interstitial pneumonia, including occupational diseases of the respiratory system
 - (b) Diseases of the mediastinum
 - (c) Others under this title
- 111. Diseases of the mouth and annexa
- 112. Diseases of the pharynx and tonsils (including adenoid vegetations)
- 113. Diseases of the esophagus
- 114. Ulcer of the stomach and duodenum
 - (a) Ulcer of the stomach
 - (b) Ulcer of the duodenum
- 115. Other diseases of the stomach (cancer excepted)
- 116. Diarrhea and enteritis (under 2 years of age)
- 117. Diarrhea and enteritis (2 years and over)
- 118. Appendicitis and typhlitis
- 119. Hernia, intestinal obstruction
 - (a) Hernia
 - (b) Intestinal obstruction
- 120. Other diseases of the intestines
- 121. Cirrhosis of the liver
 - (a) Specified as alcoholic
 - (b) Not specified as alcoholic
- 122. Biliary calculi
- 123. Other diseases of the liver and biliary passages (includes acute yellow atrophy)
- 124. Diseases of the pancreas
- 125. Peritonitis without specified cause
- 126. Other diseases of the digestive system (cancer and tuberculosis excepted)
- 127. Acute nephritis (including unspecified under 10 years of age)
- 128. Chronic nephritis (including unspecified 10 years and over)
- 129. Other diseases of the kidneys and annexa
- 130. Calculi of the urinary passages
- 131. Diseases of the bladder
- 132. Diseases of the urethra, urinary abscess, etc.
 - (a) Stricture of the urethra
 - (b) Others under this title
- 133. Diseases of the prostate
- 134. Nonvenereal diseases of the male genital organs
- 135. Salpingitis and pelvic abscess (female)
- 136. Nonpuerperal uterine hemorrhage
- 137. Other diseases of the female genital organs
- 138. Nonpuerperal diseases of the breast (cancer excepted)
- 139. Accidents of pregnancy
 - (a) Abortion
 - (b) Ectopic gestation
 - (c) Others under this title
- 140. Puerperal hemorrhage
- 141. Other accidents of labor
 - (a) Cesarean section
 - (b) Other surgical and instrumental deliveries
 - (c) Others under this title
- 142. Puerperal septicemia
- 143. Puerperal phlegmasia, embolism, sudden death
- 144. Puerperal albuminuria, eclampsia, and convulsions

145. Other conditions of the puerperal state
146. Gangrene
 - (a) Senile
 - (b) Others
147. Furuncle
148. Acute abscess
149. Other diseases of the skin and annexa
150. Diseases of the bones (tuberculosis excepted)
151. Diseases of the joints (tuberculosis and rheumatism excepted)
152. Other diseases of the organs of locomotion
153. Congenital malformations (stillbirths not included)
154. Congenital debility, icterus, and sclerema
155. Premature birth; Injury at birth
 - (a) Premature birth
 - (b) Injury at birth
156. Other diseases peculiar to early infancy
157. Lack of care
158. Senility
159. Suicide by solid or liquid poisons (corrosive substances excepted)
160. Suicide by corrosive substances
161. Suicide by poisonous gas
162. Suicide by hanging or strangulation
163. Suicide by drowning
164. Suicide by firearms
165. Suicide by cutting or piercing instruments
166. Suicide by jumping from high places
167. Suicide by crushing
168. Other suicides
169. Infanticide (murders under 1 year)
170. Homicide by firearms
171. Homicide by cutting or piercing instruments
172. Other homicides

NOTE: In classifying deaths from accidents, the primary nature of the accident takes preference over the mode of death. For example, a death resulting from a fracture of skull sustained in an automobile accident, would be charged to the latter.

173. Accidents in mines and quarries
174. Accidents from machinery
175. Accidents from transportation
 - (a) Railroads
 - (b) Street cars
 - (c) Automobiles
 - (d) Motorcycles
 - (e) Aeroplanes and balloons
 - (f) Water transportation
 - (g) Other vehicles
176. Conflagration
177. Accidental burns (conflagration excepted)
178. Poisoning by food
179. Poisoning by venomous animals
180. Other acute accidental poisonings (gas excepted)

181. Accidental absorption of irrespirable, irritating, or poisonous gas
182. Accidental mechanical suffocation
183. Accidental drowning
184. Accidental traumatism by firearms
185. Accidental traumatism by cutting or piercing instruments
186. Accidental traumatism by fall
187. Injuries by animals (not poisoning)
188. Starvation (deprivation of food or water)
189. Excessive cold
190. Excessive heat
191. Lightning
192. Other accidental electric shocks
193. Other external violence
194. Sudden death
195. Cause of death not specified or ill-defined

B. INTERMEDIATE LIST

1. Typhoid and paratyphoid fever (1)
2. Small-pox (4)
3. Measles (5)
4. Scarlet fever (6)
5. Whooping cough (7)
6. Diphtheria (8)
7. Influenza (9)
8. Dysentery (13)
9. Tuberculosis of the respiratory system (23)
10. Tuberculosis, other forms (24-29)
11. Syphilis (31)
12. Purulent infection, septicemia (including pyemia and bacteriemia (33)
13. Malaria (34)
14. Diseases due to animal parasites (39, 40, 41)
15. Other epidemic, endemic, infectious and parasitic diseases (2, 3, 10, 11, 12, 14-22, 30, 32, 35-38, 42, 43)
16. Cancer and other malignant tumors (44-50)
17. Benign tumors and tumors not specified as malignant (without exception) (51)
18. Acute rheumatic fever (52)
19. Chronic rheumatism, osteoarthritis, gout (53)
20. Avitaminoses (deficiency diseases) (54-57)
21. Diabetes mellitus (58)
22. Pernicious and other anemias (59)
23. Leukemia and Hodgkin's disease (60)
24. Diseases of the thyroid gland (62)
25. Other diseases of nutrition and of the ductless glands (61, 63, 64, 65, 66)
26. Alcoholism (acute or chronic) (67)

NOTE: Does not include acute poisoning by methyl or denatured alcohol. See Title No. 84.

27. Other chronic poisonings (68-70)
28. Other general diseases (71)
29. Meningitis (73)

30. Tabes dorsalis (locomotor ataxia) (74)
31. Cerebral hemorrhage, apoplexy (to include paralysis, hemiplegia, cerebral embolism and thrombosis) (76, 77)
32. General paralysis of the insane (78)
33. Other forms of mental alienation (79)
34. Epilepsy (80)
35. Other diseases of the nervous system (72, 75, 81-85)
36. Diseases of the eye, the ear and their annexa (86, 87)
37. Pericarditis (88)
38. Endocarditis and myocarditis (acute) (89)
39. Chronic endocarditis and valvular diseases of the heart (90)
40. Angina pectoris (91)
41. Other and unspecified diseases of the heart (92)
42. Aneurysm (93)
43. Other diseases of the arteries (94)
44. Embolism and thrombosis (cerebral and pulmonary excepted) (95)
45. Other diseases of the circulatory system (96-99)
46. Bronchitis (102)
47. Bronchopneumonia (includes capillary bronchitis) (103)
48. Pneumonia, lobar and unspecified (104)
49. Pleurisy (105)
50. Other diseases of the respiratory system (tuberculosis excepted) (100, 101, 106-110)
51. Ulcer of the stomach and duodenum (114)
52. Diarrhea and enteritis (116, 117)
53. Appendicitis and typhlitis (118)
54. Hernia, intestinal obstruction (119)
55. Cirrhosis of the liver (121)
56. Biliary calculi (122)
57. Other diseases of the liver and biliary passages (includes acute yellow atrophy) (123)
58. Other diseases of the digestive system (111-113, 115, 120, 124-126)
59. Acute nephritis (127)
60. Chronic nephritis (128)
61. Other diseases of the kidneys and annexa (129)
62. Calculi of the urinary passages (130)
63. Diseases of the bladder (131)
64. Diseases of the prostate (133)
65. Other nonvenereal diseases of the genito-urinary system (132, 134-138)
66. Accidents of pregnancy (139)
67. Puerperal hemorrhage (140)
68. Puerperal septicemia (142)
69. Puerperal albuminuria, eclampsia, and convulsions (144)
70. Other puerperal causes (141, 143, 145)
71. Diseases of the skin and cellular tissue (146-149)
72. Diseases of the bones and of the organs of locomotion (tuberculosis and rheumatism excepted) (150-152)
73. Congenital malformations (stillbirths not included) (153)
74. Congenital debility, icterus and sclerema (154)
75. Premature birth; Injury at birth (155)
76. Other diseases peculiar to early infancy (156, 157)
77. Senility (158)
78. Suicide (159-168)
79. Homicide (169-172)
80. Accidents in mines and quarries (173)
81. Accidents from machinery (174)
82. Accidents from transportation (175)
83. Accidental burns (including conflagrations) (176, 177)
84. Acute accidental poisonings (gas excepted) (178-180)
85. Accidental absorption of irrespirable, irritating, or poisonous gas (181)
86. Accidental drowning (183)
87. Accidental traumatism by fall (186)
88. Other external violence (182, 184, 185, 187-193)
89. Cause of death not specified or ill-defined (194, 195)

C. ABRIDGED LIST

1. Typhoid and paratyphoid fever (1)
2. Small-pox (4)
3. Measles (5)
4. Scarlet fever (6)
5. Whooping cough (7)
6. Diphtheria (8)
7. Influenza (9)
8. Tuberculosis of the respiratory system (23)
9. Tuberculosis, other forms (24-29)
10. Cancer and other malignant tumors (44-50)
11. Benign tumors and tumors not returned as malignant (without exception) (51)
12. Diabetes mellitus (58)
13. Cerebral hemorrhage, apoplexy (to include paralysis, hemiplegia, cerebral embolism and thrombosis) (76, 77)
14. Diseases of the heart (88-92)
15. Other diseases of the circulatory system (93-99)
16. Bronchitis (102)
17. Pneumonia (all forms) (103, 104)
18. Other diseases of the respiratory system (100, 101, 105-110)
19. Diarrhea and enteritis (116, 117)
20. Appendicitis and typhlitis (118)
21. Cirrhosis of the liver (121)

22. Other diseases of the digestive system (111-115, 119, 120, 122-126)
23. Acute and chronic nephritis (127, 128)
24. Other diseases of the genitourinary system (129-138)
25. Puerperal septicemia (142)
26. Other puerperal causes (139-141, 143-145)
27. Congenital debility, malformations, premature birth, etc. (153-157)
28. Other defined diseases (2, 3, 10-22, 30-43, 52-57, 59-75, 78-87, 146-152, 158)
29. Suicide (159-168)
30. Violent deaths (suicide excepted) (169-193)
31. Cause of death not specified or ill-defined (194, 195)

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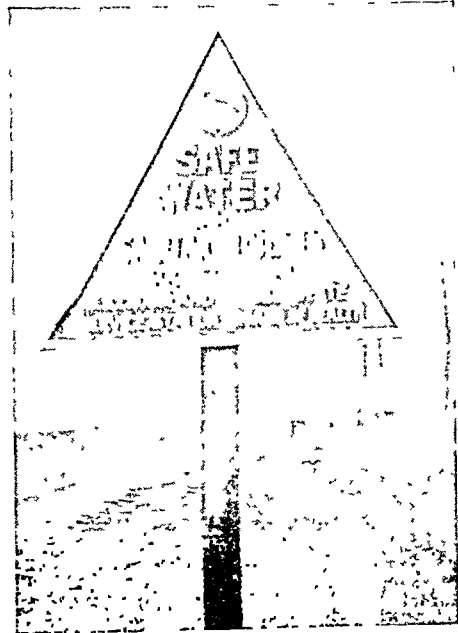
Stop! Look For The Approved Service Station

IN Delaware the State Board of Health and the owners of service stations have combined efforts to safeguard the health of motorists across the state and to afford them sanitary conveniences.

Along the roads signs posting the service stations have been erected indicating that a couple of hundred feet ahead pure water supplies and sanitary toilets are available.

Periodic monthly inspection of all signed service stations is made by the State Board of Health and where sanitary standards demanded by health authorities are not maintained, the signs are taken down. Sixteen stations are equipped with water under pressure and have flush toilets with connection to septic tanks. The majority provide wash basins, soap and paper towels and cups. Two of the approved stations have shower baths. Several provide rest rooms for women.

The signs erected, at an original cost of \$6.30 each, by the service stations are 32" on each face with a green back-



ground, white letters and a white border. They are mounted on green posts 9' x 5" x 3". The sign bears a Blue Hen, the insignia of the State of Delaware.

The Venereal Disease Clinic*

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THE essentials in the organization and operation of a venereal disease clinic will vary according to the amount of money available and the purpose of the clinic.

In this paper the essentials of only one type of clinic will be considered, the clinic which is run chiefly in the interest of public health in a city with a population of not less than 25,000 or in a smaller center serving a population of at least 50,000. In cities of half a million or more inhabitants, certain clinics may have an overabundance of funds and may find it necessary to add to the essentials in order to increase the budget, but some of the worst clinics may be found in the largest cities. In any city, the essentials described will serve as a framework, and additions may be made according to the available financial and medical facilities, and the necessity of treating a greater number of persons.

ESSENTIALS OF ORGANIZATION AND OPERATION

Organization—The physician who is organizing a clinic should get the active support of the local and state health departments as well as the hospital or branch of the local government which provides the clinic facilities. The physician alone may have difficulty in educating the local politicians to the necessity for a clinic, but the educational work by the local and state health department will teach the local officials the need for a venereal disease clinic.

If the clinic is to be placed in a small hospital in a small town there may be some difficulty in getting clinic space, although in the larger city the hospital usually has run a clinic long before the department of health became interested. Before the war many of these hospital clinics were of doubtful value to the community, but the need for efficient antivenereal work during the war stimulated these clinics to do more scientific work, and local health departments since then have succeeded in making many of them of greater value to the community by stimu-

* Read at a Special Session on Venereal Disease Control, of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 20, 1927.

lating a public health attitude. The local health department should be active in supervising and often in performing the public health work of the clinic. The best results are obtained where an active health officer actually controls the work of the clinic and directs its public health activities.

In many places where there were no clinics the state health departments have provided funds for the first year while the clinics were being organized, but it should be realized that every clinic is primarily a local problem and should be supported by those it serves. Usually there is little difficulty in obtaining the necessary funds in localities really needing clinics. Most hospitals are willing to supply space if the local health department supplies the drugs. In fact, many hospitals bear the entire burden, except for the assistance of a small fee from the patient.

When the clinic is entirely supported by the hospital, usually the physicians receive no remuneration other than the experience they may get and the advertising value of the position. In some hospitals, a fee is charged and the physician is given money for his services. The objection to this plan is that there usually is active competition by the pay clinic with many practicing physicians even though a pay clinic does not injure the practice of those who treat only the wealthy.

In the hospital clinic, a nurse is supplied for the clinic hours, but sometimes there is difficulty in obtaining a clerk, so occasionally the nurse is given this additional work. When a clerk is not provided, usually there is no follow-up work done, unless it is by the local health department. Efficient follow-up work is the essential public health work of the clinic, as it brings under treatment sources of infection and keeps the fresh cases under treatment until they remain permanently non-infectious. A clinic without efficient follow-up service is of doubtful value to the community.

In the public health clinic, run and financed by the local health department, the physician usually is paid a yearly salary. This salary varies from a nominal figure to adequate compensation, as each community has a different idea about the public health value of physicians.

The probable reason for the extreme variations in methods of financing clinics is that venereal disease clinics have only recently become of value to public health. Previously clinics were merely places where physicians acquired experience in examining patients instead of, as now, being places where the patients are relieved and made of little danger to the public health.

Operation—For the operation of the clinic, the essential staff consists of a physician, a nurse, and a clerk who is also the follow-up worker. Usually there will be a much needed assistant physician.

The physician should assign the duties of the staff, form the policies of the clinic, and teach the others to do much of the examination and treatment work and do the rest himself.

The nurse should prepare the clinic, the drugs, and instruments for use at each clinic period. The nurse usually is a woman and may prepare the patients of both sexes. She should be held responsible for all equipment being in the proper condition before it is to be used. If the nurse is incompletely trained, the physician should see that she learns to keep the needles polished with a scouring powder and sharpened with a fine pocket stone and free from any hooks or burrs. Syringes of good quality can be dropped into boiling water and sterilized ready for use with needles attached, so there is no necessity for separate sterilization and mixing of plungers and barrels with greater chance for contamination in the assembling process. She should teach the patients to get into position for examination or treatment quickly. After a little training, an intelligent nurse or other person can take blood specimens, and give intramuscular and intravenous injections, under the supervision of a physician. If the physician does most of this work, the nurse should fill the syringes, and receive the intravenous syringes as they are used, immediately running water through the syringes and needles and returning them to the sterilizer.

The clerk should admit the patients to the clinic, fill in the histories as far as possible, check the delinquent patients and send out the form letters requesting them to return. The clerk may do the follow-up work of delinquent patients if it is not done by the local health department or the nurse.

Follow-up work can be done not only by outside visits and letters, but by the patients themselves. The patient in most cases can be persuaded by means of proper educational work in the clinic to bring in the known source of infection. This educational work by all the members of the staff will put the patients in such a frame of mind as will decrease the number of delinquent patients. There will be a certain amount of overlapping of duties, but the physician can decide on the basis of local conditions the best way to assign the work.

The operation of the clinic will be much simplified if there is a definite routine for each patient on admission.

An intelligent clerk with a little experience can classify correctly with a provisional diagnosis of gonorrhea or syphilis most of the patients as they apply for treatment. This clerk should fill in the history with the name, address, date, age, sex, color, nativity and marital status, the apparent duration of infection, the name and address of the source of infection, the date of exposure as nearly as can be deter-

mined, the date of the first symptoms, and sometimes naming the important symptoms with a very short statement of the subsequent course of the disease. The patient's occupation should be entered, together with the weekly income and the number of dependents, the employer's name and business address, and the name and address of any persons exposed since infection.

If the patient has congenital syphilis, the name and address of the father and mother and sisters and brothers should be listed, and the patient should be urged to bring these persons into the clinic for examination. If the patient has acquired syphilis, the name of the husband or wife and children should be entered and the patient should be told to bring in these exposed persons for examination. In states where it is required by law, the name and address of the source of infection should be reported to the state department of health, and an entry should be made on the history as a check to show that a report was sent to the state department of health. Sometimes these reports cannot be sent out immediately and there should be some way of checking over the histories from time to time.

If the patient has gonorrhea all persons exposed since the time of the infecting contact should be placed under observation by a visit to the clinic. Their names should be entered on the history form immediately, and the findings when they are brought in and examined.

After the clerk has filled in the history as fully as possible, the patient is taken to the physician to have the examination completed, the diagnosis made, any necessary treatment outlined provisionally on the history, and any further recommendations made about contacts and diagnostic procedures. If it is possible before any treatment is given, the social worker or some other person should make the patient thoroughly understand his duty in avoiding any further spreading of his disease and the assistance he should render in helping to control venereal disease as a partial return for the medical service he is to receive. A card for the immediate attention of the follow-up worker should be made out for each source of infection or apparently infectious contact.

The follow-up worker should inspect the treatment sheets at definite intervals to see that the patients are attending the clinic regularly. The physician should mark on the chart by drawing a line for each week the patient is told he need not attend the clinic whenever his injections are temporarily discontinued. Then these patients who are not delinquent will not be told by mistake that they should be in the clinic.

This definite routine in the operation of a venereal clinic will save time and make more efficient the work of the physician in diagnosis and treatment.

ESSENTIALS OF DIAGNOSIS AND TREATMENT

A tentative diagnosis of venereal infection may be made from the immediate findings, but every patient should have blood taken for tests for syphilis, and should have a general physical examination, preferably stripped, which should include an examination for gonorrhea. This general examination of all persons for both gonorrhea and syphilis should be supplemented by special examinations for the particular disease which is very strongly suspected. Infections with two diseases are so common that syphilitic females particularly should be examined for gonorrhea, and all patients, of course, should have a routine blood test for syphilis. In the examination for syphilis and chancroid, the laboratory procedures usually are the more important, but in watching for gonorrhea, except in the acute stage, the clinical findings are the more significant.

GONORRHEA IN THE MALE

The diagnosis of acute gonorrhea in the male is obvious if the patient presents himself with a purulent urethral discharge coming on in from 2 days to 2 weeks after intercourse. Even in a public health clinic it is well to spare the slight time to make a smear in order to avoid the mistake of thinking that more than one discharge in a hundred is caused by anything but the gonococcus.

When the patient's discharge has ceased he is ready for the tests of cure. When the patient goes through a period of 1 month without any discharge or morning drop, he is given an instillation of 2 c.c. of a 1 per cent solution of silver nitrate. He comes back one month later, if he has no discharge in the meantime, and is given another instillation. In 4 weeks, if he has had no discharge, a large sound is passed. At the end of another month he returns for the passage of another sound.

If all the tests of cure are negative, he is told he is probably cured, but that he should have no intercourse without a condom for the next 6 months. He is told that if he has no symptoms in the meantime he can consider himself cured at the end of that time.

While the majority of cases of acute gonorrhea get well fairly readily under ordinary treatment, a tenth will be found to have a persistent morning drop or other sign of chronic gonorrhea.

The diagnosis of chronic gonorrhea in the male is made on the clinical evidence with such findings as an excess of pus cells from the prostate and various kinds of shreds in the urine. There is little chance of proving the presence of gonococci by smears. Most cases with persisting intracellular gonococci in the discharge should be classified as

acute or subacute gonorrhea, even though the disease may have been present for some time, as such patients require more gentle treatment than the usual case of chronic gonorrhea.

The exact treatment whether by dilating or by massage of the urethra and prostate and seminal vesicles or by stimulating injections and applications will depend mainly on clinical findings. Results of treatment will depend upon the energy, intelligence and experience of the clinician and not upon any textbook routine.

GONORRHEA IN THE FEMALE

The diagnosis of gonorrhea in the female in the acute stage can readily be made on either clinical or laboratory evidence. Smears from the urethra at this time will generally show almost as definite a picture as smears in acute gonorrhea in the male. The diagnosis of chronic gonorrhea in the female is difficult and usually must be made from the history and clinical findings. A profuse vaginal discharge and cervical involvement without obvious cause should be tentatively considered gonorrheal until proved otherwise. Induration of Bartholin's glands and inflammation or induration of the urethra are further evidence of gonorrhea, although not pathognomonic.

A carefully taken smear from the urethra may show gonococci. The tip of a wooden applicator is tightly wound with just enough cotton to cover it and inserted gently almost one-half inch into the female urethra, which is well massaged or "stripped" from below. This applicator is rolled or tapped over one end of a microscope slide to make an impression preparation instead of a smear. Material from the cervix is not so likely to show a good picture of gonococci, but any pus from Bartholin's gland usually will show many Gram negative intracellular diplococci. A good Gram staining method is Jensen's.² It is difficult to diagnose chronic gonorrhea in women and even more difficult to determine when it is cured, as all tests may fail in gonorrhea in women until another male is infected.

Gonorrhea in women can be cured if the coöperation of the patient can be obtained. Routine treatment will clear up most cases without complications if the disease has not already spread to the tubes or produced a severe inflammation of one of Bartholin's glands. The routine of treatment should combine simplicity with efficacy, and preferably not necessitate more than one treatment per week.

Tests of cure are unreliable as the gonococci are not found in smears long before the patient is cured, and complement fixation tests are still less dependable. So we have to rely upon clinical findings such as the absence of any areas of inflammation or abnormal discharge.

SYPHILIS

The diagnosis of syphilis by laboratory methods is the most accurate and satisfactory diagnostic procedure in the clinic. Every patient coming to the clinic should have blood taken for a Wassermann. Suspected primary lesions will in most cases give a positive Wassermann reaction, but one should not wait for this test, for of course in the very earliest stage the Wassermann is negative.

If primary syphilis is suspected, a darkfield examination should be made immediately. A good grade of darkfield equipment should be used or the diagnostic effort will be worse than useless. The combined light and substage commonly known as the Army Medical School type is mentioned only to be condemned. It is best to try out the type of darkfield offered by a manufacturer on mouth spirochetes before purchasing. A cardioid condenser that fastens securely to a rack and pinion substage is part of a satisfactory equipment. A special darkfield objective such as the 60X apochromat with iris diaphragm of Zeiss is little more expensive than the ordinary objective with a separate funnel stop but is much more satisfactory to use. The very bright concentrated filament lamp is more convenient and cheaper than most arc lamps.

The persons using the darkfield should thoroughly digest the directions which should always be supplied by the maker with any form of darkfield. If the spirochetes appear as a row of dots instead of like a corkscrew, the operator of the apparatus is ignorant of the method used for that particular type of darkfield, or the equipment is poor. In either case it is inexcusable and dangerous to attempt to make a diagnosis by such means.

A sensitive Wassermann test will confirm the darkfield findings in 90 per cent of the cases at the time they arrive at the clinic. A negative Wassermann is probable with most sores of less than 10 days duration, but very improbable after the third week of the sore. If the darkfield is negative, the Wassermann should be repeated every week until 5 weeks from the date of the appearance of the sore, and it should be repeated again 1 month or 2 months later before the patient should be assured that he is not infected with syphilis.

A carefully made sensitive Wassermann reaction is still the most accurate diagnostic serum test for syphilis, even though a few laboratories are now doing only a flocculation test. Most of the flocculation tests not only are less sensitive than a good Wassermann test but also are more liable to produce false positives. The simplest flocculation test is Dr. Kline's microscope slide method with his new antigen, which is almost as sensitive as the most sensitive Wassermann, but in

my hands has occasionally produced a weak reaction in the absence of syphilis.

No matter what blood test is used for syphilis, a single positive report should never be considered alone as proof of syphilis. Two positive reports should be received before accepting the Wassermann as proof of syphilis. Three or more weak positives or doubtful tests are necessary as good evidence of syphilis. With continued doubtful reactions, a lumbar puncture may disclose a spinal fluid with an increased cell count and a positive Wassermann. Not only should all positives or doubtfuls be repeated, but all negatives also should be repeated when there is contrary evidence. The repetition of all positive or doubtful reactions should be an automatic routine arranged by the clerk.

The infectious cases of syphilis usually will have either a positive darkfield or positive blood test. The primary lesions and early secondary lesions may be proved syphilitic immediately by the darkfield examination and given immediate treatment.

The microscopical demonstration of spirochetes in some cases of secondary syphilis may be very difficult, even though the lesions are very infectious, but the Wassermann will always be strongly positive. The experienced clinician, however, will not wait for the result of the blood examination, but will make a clinical diagnosis of secondary syphilis from typical lesions and institute treatment immediately. A Kline flocculation test, which can be done in less than an hour, if negative, will rule out secondary syphilis in a difficult case, or will be positive in a case of secondary syphilis.

The dangerously infectious cases are required to adopt extraordinary precautions during the first week of treatment to avoid infecting others. During this week they should have their own eating utensils, keep their clothing out of reach of others, and avoid the company of others as much as possible. After this short period of intensive treatment, they are relatively non-infectious, as long as they continue vigorous treatment, and then need not adopt special measures to avoid the ordinary human contacts.

A routine of treatment should be developed in which nearly all of the patients receive the same drug at their weekly visits to the clinic. A convenient method is to divide the year into 4 quarters of 13 weeks each, and to repeat a definite routine course of treatment 4 times a year with no rest period. Such a routine is described elsewhere.*

The length of such routine treatment of syphilis necessary to render the patient permanently non-infectious from the standpoint of public health, in ordinary contacts excluding pregnancy, is only 6

months, but it should be the aim of the clinic, as far as its finances will permit, to cure the patient. If the finances are limited it is better to make 100 patients permanently non-infectious than to spend the same amount of effort in attempting to cure 20 patients, or, as would be more likely, to confine the attention to only 10.

If cure is the aim, the earliest case should receive at least a year of treatment after the blood (and spinal fluid) Wassermann or Kahn test has become negative and remains so. If a specially sensitive Wassermann or Kline flocculation test is used, possibly a 6-months period of continuation treatment with continued negative tests is sufficient. No patient however early he is treated should receive less than a year of vigorous treatment.

CHANCROID

A diagnosis of chancroid uncomplicated by syphilis should not be made and treatment of any kind should not be given until at least two negative darkfield examinations have been obtained. The diagnosis of uncomplicated chancroid is made by demonstrating the absence of spirochetes and the presence of the Ducrey bacillus in serum from the edge of the ulcer.

SUMMARY

The success of a venereal disease clinic will depend upon the interest of the community, the health department, and the local physicians. The enthusiasm and energy of a single individual, especially a good follow-up worker or nurse, is often responsible for clinic efficiency.

Clinic efficiency with limited funds is dependent upon the adoption of simple rules or routines of treatment. The physician in charge of the clinic must be careful not to fall into the rut of merely making diagnoses and giving treatment. The value of the clinic is dependent primarily upon the number of early cases and sources of infection brought in and rendered permanently non-infectious.

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NOTE: Reprints of the complete article, including methods of treatment of the venereal diseases, may be obtained from the author.

Health Education Program in a City of 100,000*

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WHAT ARE your public health education program and budget? This question was asked of health departments in 26 cities of 100,000 population. The replies were interesting. Few seemed to know what the question meant. All of them disclaimed any special health education service, save certain cities whose programs were supplemented by county or outside funds, and were therefore, not thought representative of cities of this size. Some took the query to refer to work done in public health nursing, others to health education in the schools, and still others thought it had some connection with the issuing of annual reports or the work of a communicable disease bureau. A few mentioned occasional newspaper articles, the publication of bulletins and special pamphlets, and the delivering of health talks. Each of their answers was right in part.

For the purpose of this discussion we shall fence off under the title "health education" only the territory represented by the services of the department of health. The question, then, is how can we make the health information existing in every health department more readily available to a given community?

Sales experts tell us that mass selling is the quickest and most economical way of reaching the public. Mass selling, when connected with a department of health, becomes an interpretation of health facts on a city-wide basis. How can we incorporate this feature then in our health department program? The U. S. Public Health Service and the American Public Health Association consider that mass selling or a health educational program may be conducted more effectively in a city of 100,000 if it is developed and carried on under the immediate supervision of a trained and experienced director who shall work under the close supervision of a health officer. Whether this service be included under the head of a separate bureau or whether it be a subdivision in the administrative department, is a matter for each health department to work out for itself; but that it should exist in some form

* Read at a Joint Session of the Health Officers and the Public Health Education Sections of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 18, 1927.

in a city of 100,000 population seems to be an established opinion.

Our next task is to finance this division or bureau and set it off with a program of action. The American Public Health Association, in its publication, *Community Health Organization*, states that the budget for health education in a city of 100,000 may be set at \$4,200. A relatively low figure, \$2,200, is assigned from this amount as the salary for the assistant in charge, and \$2,000 as the modest allowance for printing and other incidental expenses.

Turning to *Public Health Bulletin No. 164*, published by the U. S. Public Health Service, whose chapter on health education is written by Harry H. Moore, we find \$9,300 suggested as the minimum expenditure consistent with a reasonably adequate program for an average city of 100,000. The figure is divided in the following way: \$3,500 as salary of the chief of the bureau; \$1,800 for an assistant, and \$4,000 for printing, exhibits, and other incidental expenses connected with the service.

Which is right? The average commercial house assigns from 2 to 5 per cent of its budget for publicity and advertising. Health education represents the publicity and advertising service of the health department.

If we accept the American Public Health Association's estimate of \$217,090 as the budget for all activities of a health department in a city of 100,000 for a year, we find that the amount allotted by this same organization to public health education represents 1.9 per cent of the total health department budget, while the amount proposed in *Bulletin No. 164* equals 4.2 per cent of the total budget. The estimates of our authorities, therefore, range from approximately the minimum advertising rate to some degrees below the maximum one.

Meditating upon these budgets we are forced to admit that the average city of 100,000 which, in the year 1927 has no clearly conceived notion of health education as a separate service of the health department, will be much more inclined to adopt the smaller than the larger budget, no matter what advantages we may list after the \$9,300 figure. Assuming that \$4,200 is the allowance, what is its purchasing powers? Let it be understood that the budget figure covers only current expenses, office space being provided for the health education service as well as necessary permanent equipment.

QUALIFICATIONS OF HEALTH EDUCATOR

A health education program to be successful must be directed by a person of adequate training and experience. Who is the right person? The right person for a health educational job in a municipal health

department should have a sense of news values and the ability to translate technical material into popular terms. As this is an age of training, we shall not choose the health educator by chance but shall select a person for this position who has had a college education and some training in general publicity and advertising. A good newspaper person may be induced to take a short course in publicity and advertising in some of our universities and so prepare for the position, but experience alone in newspaper work is not enough to make the all-round health educator. There must be special preparation for the job. To these qualities add diplomatic salesmanship, without which all other attributes fail.

Demanding such qualifications it is evident that the salary allotment of \$2,200 is not likely to procure a person so equipped, and endowed. For that reason a suggestion is made to appropriate \$3,000 for the salary of a director of health education. The services of a clerical assistant for one week each month will cost \$300. This secretary may be procured from the staff of the health department or engaged outside.

Having paid off our personnel, we find we have \$900 left in our budget. How much of a health educational program can we buy with this limited allowance?

NEWSPAPER MATERIAL

First and most important is the preparation of material for the daily press. Through this medium the health educator reaches more people than in any other way. To get the most out of opportunities offered, the health educator will map out for himself a program like this: Visit each bureau of the department of health daily in search of news material. Couple the news with health educational facts. Train staff of health department in acquiring a "nose for news." Watch for good news pictures of health activities for a good news picture is worth more than the average news story. Prepare feature stories for local papers frequently on some health activity. Keep in close contact with the city editor, the managing editor, the editorial writer of each paper, and with reporters. Hand in to editorial writers interesting topics for discussion. Keep in close touch with the advertising department of each paper because often through them valuable health copy may be inserted in the space of large advertisers. With their coöperation issue special health numbers from time to time to be floated by advertising—the department of health furnishing the copy and censoring the advertising of these numbers. Do not forget the children. Write stories on health for them at regular intervals and publish in local papers. Send health articles to the foreign papers and all house organs.

The second phase is the organization of a lecture service. Through this service the department of health keeps the various clubs, churches, labor groups and other civic organizations in the community in touch with its individual and community program of public health. The service is without charge. The speakers should be the best authorities the community affords on the various phases of health work and disease prevention. The lecture service may be announced verbally by the health educator to the organizations themselves or through the newspapers or by mail, or through all of these ways combined. Each health talk furnishes a news item and serves not only to get over the desired health information but to keep this service constantly before the public. To add the value of visualization to the service, motion picture films may be used. These films may be borrowed from many of the state departments of health and from some of the large insurance companies without charge. If the health department does not own a motion picture machine, it is quite possible to borrow one, or to get some civic organization to donate such a machine. Health talks for adults and health stories for children at the bedtime hour may be broadcast over the radio. They may be told also in the weekly story-hour at the library.

Balancing the ledgers we find that this part of the program is included under the service of the health director, although a minimum charge may be incurred if organizations are notified by mail of the speakers' bureau activities. This amount we shall take from the allotment set aside for postage and office supplies.

MONTHLY BULLETIN

The third consideration is the publication of a monthly bulletin to reach an audience composed of physicians, nurses, social workers and other persons in the community. With a limited budget it seems advisable to mimeograph the bulletin in the health education office. Wide margins, frequent and inviting captions and fitting illustrations may be employed to attract the eye and induce reading. The bulletin may take the form of a news letter from the commissioner of health, or be a digest of health activities. A brief statement of prevailing communicable diseases with comments should be included in either type of bulletin. Fifteen hundred bulletins in a city of 100,000 will be adequate for the interested groups. For this service an allotment of \$510.49 is made. This figure includes the cost of paper, stencils and ink and printing the address of the department of health on every envelope. It purchases the best grade of mimeograph paper. The stencils are cut and run off by the clerical worker assigned to the service. The bulletin is sent out

in a 2 cent stamped envelope. This insures both better postal service and better attention on the part of the addressee. It means that if the bulletin for one reason or another is not delivered, the post office will return it to the sender. In this way the health department is able to keep its mailing list up-to-date. The stamped envelopes are included in the figure quoted for the bulletin.

ANNUAL REPORT

The annual report is the fourth problem. To help in budget saving the report can be mimeographed in the office on letter-size paper. It should be bound in a cover of heavier paper and bear a printed title. The estimate of \$48.60 for a 60-page report is based on an order of 100,000 copies for circulation among the administrators of the city government and a small selected group of interested citizens. To bring this report to the attention of a large number of city taxpayers, the health educator will make a more or less popular digest of it for publication in the local papers.

EXHIBITS AND POSTERS

As a large group of people either never read the newspapers or confine their attention solely to the headlines, or certain features, we realize that exhibits and posters have a decided part to play in every well organized health educational program. To make our budget go as far as possible we seek the assistance of the art department in our schools. A health poster contest is staged among the school children. This insures both publicity and posters. In order to get the necessary exhibits for our work, help is asked of the manual training department in the schools.

Exhibits and posters made in any of the following ways may be used in store windows, shows, fairs, schools, clinics, business and industrial centers. If it is impossible to secure the coöperation of the art department in the schools for posters, pictures may be clipped from magazines and mounted, and appropriate health messages attached. A corner for health books in the public library may be arranged. Ingenuity and a knowledge of mass psychology rather than expense are the factors which determine the success of exhibits. To this phase of our program we allot \$40 to be used in captions for exhibits, mounts for posters, and the purchase of posters if such are needed.

POPULAR LEAFLETS

Now we have \$300.91 of our budget unspent. We need popular health leaflets for our lecture groups, our clinics, and to answer many inquiries that come into the health department office. Our budget is too

limited to enable us to print our own circulars, but most state departments of health have leaflets that may be obtained at a nominal cost. Many insurance and large commercial concerns also have literature which they are glad to distribute without charge. The difficulty lies in the fact that many of the publications offered are drab and uninteresting in form and not likely to intrigue public reading, although there are notable exceptions. Moreover, one has always to watch one's step in regard to these publications to see that the advertiser does not place the wrong emphasis on the value of his product. In many health departments there is a distinct aversion to using advertising of any kind. When this feeling exists it makes the task of the health educator a difficult one. Illustrations and snappy titles used on mimeographed sheets of health facts will be found an aid in intriguing public interest. For this service, which is a most important one, we allot the sum of \$80. This leaves us \$220.91 for necessary office supplies and postage.

As you think over the program you will see that each saving of a dollar has meant extra exertion on the part of the health director and has consumed much time—time which perhaps might better be spent in making more vital contacts. With an increased budget more attention could be given to working out the main features of the program; the monthly bulletin might reach a large audience if the needs of the community seemed to demand this, or the popular bulletin of the American Public Health Association might be adopted and given wide circulation; the annual report might be put into more valuable and lasting form; publications for the various clinics and services of the health department might be issued to meet better the needs of the community.

Every program in health education must be adapted to the place it is to fit. It is well to remember that the person whose nose is too close to the grindstone is apt to miss many opportunities. The budget we have discussed is submitted as a minimum budget for a health education program in a city of 100,000. It is our expectation that the health educator will so sell this service in a few years time that the city fathers will grant the health commissioner an increased fund for carrying on a work so vital to 100,000 of its city's inhabitants.

Endemic Goiter and Public Health*

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ENDEMIC GOITER with its varied manifestations and biological effects upon the human race is an interesting study. We have volumes on this age old disease giving the theories of its origin, its effects on the individual and his descendants and the various methods of treatment from one generation to the next. The purpose of this paper is to correlate briefly the facts regarding this disease at the dawn of our scientific medical era, to interpret the findings through the last century in the light of our present knowledge, and to point the way for progress. We are not thinking in terms of curative medicine, which was the viewpoint for centuries, but always in terms of preventive medicine.

Iodin was first used in the treatment of this disease by Dr. Coindet¹ when he painted goiters with tincture of iodine in 1820. His results and teaching were sufficient to establish permanently a relationship between iodine and goiter.

In 1850 Professor Chatin² of the University of Paris stated that goiter was due to a deficiency of iodine in air, water and food. However, he could not demonstrate this deficiency and his theory was not generally accepted. Then in October, 1858, before the Imperial Academy of Medicine in Paris, a symposium was held on the treatment of goiter with iodized salt. The authors of this meeting, Dr. Rilliet³ of Geneva and Dr. Boinet⁴ of Paris, refer to the work of Dr. Grange of Geneva, who had given before the Medical Society of Geneva his theory on the cause of goiter and advised the use of iodized salt, which he had used several years (one part of iodine potassium to 10,000 parts of cooking salt), as the best method of preventing as well as curing the tumorous enlargement of the thyroid gland.

In 1867 Saint-Lager⁵ published his first volume on endemic goiter and cretinism, and his second volume the following year. This work represents a personal study of many sections of France. The so-called goiter districts were studied as to geological formation, drinking water and vegetation. He believed in general that where the drinking water traversed calcareous soil there was little or no goiter, while in districts where it traversed sandstone deposits goiter was prevalent. He also agreed with the old idea that it is a water-borne disease, but was never

* Read before the Sixth Annual Public Health Conference, Lansing, Mich., December 2, 1926.

able to estimate the etiologic factor. With the new idea that goiter is due to a deficiency of iodine, Saint-Lager had little sympathy, and his criticisms had considerable weight in discrediting this theory. He writes: "Chatin, the originator of this theory, found that in the plains of the River Po goiter was very frequent, yet the air of these plains contains notable quantities of iodine." Saint-Lager does not tell us how he measured this air for its iodine content.

In 1874 Sir William Gull⁶ described in detail a case of myxedema, calling it a cretinoid state supervening in the adult life of women. He stated that this symptom complex was due in some way to a lack of function of the thyroid gland. This is the first scientific statement regarding the functions of the thyroid, and our studies from this period on have to determine accurately the physiology and biochemistry of this important gland. In 1883 the surgeons, Kocher and the Riverdin brothers, got exactly the same symptom complex as a result of total thyroidectomy. This strengthened Gull's theory, and when a few years later McKenzie and Murray showed definite improvement in a case of Gull's disease by feeding a glycerinated extract of sheep thyroid, this theory was considered as established. It still stands out as one of the fundamental facts showing the influence of the thyroid on general metabolism. In 1892, Magnus-Levy showed in a very scientific manner that the thyroid controls the rate of heat production, and that in cases of exophthalmic goiter heat production is markedly increased while in so-called Gull's disease it is markedly decreased.

In 1888 William S. Halsted⁷ with experiments on dogs had shown that if you remove as much as three-fourths of the thyroid, the remaining one-fourth undergoes a hyperplasia and hypertrophy that is histologically the same as is seen in goiter formation. Also during these experiments he found that, while the thyroid in a pregnant female dog was enlarging, the pups' thyroids were undergoing hyperplasia and at birth were definitely enlarged.

In 1895 the relation of iodine to the thyroid gland was again emphasized when Baumann⁸ of Freiburg found by chemical analysis that the thyroid contains iodine; yet the full significance of this discovery was not appreciated for some years. In 1902 the further studies of Baumann and Roos showed that when iodine is stored in the thyroid it combines with the globulin to form what they called thyroglobulin.

Our detailed information on the physiology and biochemistry of the thyroid was worked out by Marine and his associates. Marine and Williams,⁹ studying the histological changes which constantly take place in the formation of goiter, found a definite cycle of changes which is the same for all animals studied. A fall in the iodine store always

precedes any cellular changes. Then comes a decrease in the stainable colloid, followed by change in shape together with multiplication of cells (active hyperplasia) and glandular hypertrophy. They repeated the experiments of Halsted and found that we can remove as much as five-sixths of a dog's thyroid and if the remainder be kept saturated with iodine the cellular changes, which heretofore had been constant, do not occur.

During these experiments they also showed the relation of iodine deficiency to congenital goiter. A female dog with three-fourths of the thyroid removed was permitted to become pregnant and was kept on a diet low in iodine. At birth all of the pups had enlarged thyroids showing the same histological changes as are seen in early goiters. Also the iodine content was below normal. This same female dog was again permitted to become pregnant and was this time given a definite amount of iodine each week so that her thyroid remained normal in size. At birth all of these pups had thyroids normal in size, in histological structure and in iodine content. This experiment has been repeated several times and is of fundamental importance in the prevention of endemic goiter.

In Marine's¹⁹ series of different animals, including dog, rabbit, pig, ox and man, the amount of iodine required to keep the thyroid normal seemed to be very constant. The maximum amount of iodine found in normal thyroids was approximately 5 mg. per gm., with an average of 2 mg. per gm. and a total of 40 mg. for the normal adult human thyroid. As long as the iodine content remained above 1 mg. per gm. of dried tissue, no cellular changes would be found, but as soon as the iodine content fell below 1 mg. per gm., or 0.1 of 1 per cent, active hyperplasia and hypertrophy took place. From these experiments Marine states that the normal function of the thyroid depends entirely on iodine. From these same studies came the now famous dictum: Simple goiter is the easiest known disease to prevent.

Although as early as 1870 the farmers of Michigan were preventing endemic goiter and cretinism in their sheep by the use of crude salt from a certain district, yet they did not appreciate what they were preventing or how it was accomplished. The first systematic effort to prevent goiter in animals was applied to the fish-raising industry at the State Fish Hatcheries at Shady Grove, Pa., from 1909 to 1910.²⁰ Here an exceedingly small amount of iodine in the water controlled what had come to be known as a serious endemic goiter problem. They are still carrying on this prophylaxis by the use of food rich in iodine twice weekly. This work, which is too well known to be recorded here, proved the fundamental truth of the hypothesis, and gave conclusive

evidence that goiter in animals can be prevented by the administration of a small amount of iodine.

Endemic goiter had been repeatedly stressed as a deficiency disease, and we had stated that there is a definite deficiency of iodine in food and drink in the so-called goiter districts, but a systematic effort at prevention in man was not undertaken until the fall of 1916. This work was started by Marine and Kimball¹² in the schools of Akron, O.

There were 2 important reasons why this work should be started throughout public schools: First, the future of this health measure depends entirely upon the education of the community as a whole; second, in our public schools we have the children at the adolescent period when, as we know from common observation, goiter is most prevalent. Therefore, with the coöperation of the authorities of the Akron public schools, a survey was made of the girls only, from the fifth to the twelfth grade inclusive. Our survey showed that 56 per cent of these girls had definite thyroid enlargement. For practical purposes we did not at that time call anything goiter which could not be easily demonstrated. This means that 56 per cent of these girls had visible goiters. Our plan of prevention was to saturate the thyroid gland twice a year, spring and fall, and to this end we gave each girl, who must volunteer and also show a permit from the parent, 3 gr. of sodium iodide daily in the drinking water over a period of 2 school weeks (10 days), each November and April during the next 4 years.

Of the 2,190 pupils taking 2 gm. of sodium iodide twice yearly, only 5 developed thyroid enlargement; while of 2,305 pupils not taking the prophylactic, 495 developed thyroid enlargement. Of 1,282 pupils with thyroid enlargement at the first examination who took the iodine systematically, 773 thyroids decreased in size; while of 1,048 with thyroid enlargement at the first examination who did not take the prophylactic, 145 thyroids decreased in size. These figures demonstrate in a striking manner both the preventive and the curative effects.

Following the publication of the work in Akron, Klinger¹³ started the prophylaxis throughout the schools of Zurich. Early in 1921 his reports showed even more curative effect in this district than we obtained in Akron. He worked in schools, however, where the incidence of goiter varied from 82 to 95 per cent, while our highest incidence was only 56 per cent. With such a high incidence his results necessarily deal more with the curative effect. Thus of 760 children, 90 per cent were goitrous at the first examination, but after 15 months 643 who were reexamined showed only 28.3 per cent goitrous. During these months each had received 10-15 mg. of iodine each week, using the iodostarin tablets.

TABLE I
RECORDS OF PUPILS TAKING AND NOT TAKING
PROPHYLACTIC TREATMENT

	Taking		Not Taking	
	Totals	Per Cent	Totals	Per Cent
Normal				
Unchanged	906	99.8	910	72.4
Increased	2	0.2	347	27.6
Slightly Enlarged				
Unchanged	477	41.9	698	72.8
Increased	3	0.3	127	13.3
Decreased	659	57.8	134	13.9
Moderately Enlarged				
Unchanged	29	20.3	57	64.0
Increased	0	0.0	21	23.6
Decreased	114	79.7	11	12.4
Total	2,190		2,305	

Prophylaxis through the schools was adopted by several Swiss cantons, and the Swiss Goiter Commission after a study of the problem decided that the iodine deficiency should be met as a food problem and soon advocated the use of iodized salt. The use of their so-called Standard Salt was begun in the canton of Appenzell in February, 1922, and just a year later it was extended to the cantons of Zurich, Luzern, St. Gallen and Thurgau. Prophylaxis in the district of Appenzell has been under the close supervision of Dr. Eggenberger." The salt has been examined in his laboratory at Herisau, and during the last four and a half years he has made 2,700 iodine determinations. He has also pointed out some very definite results. He states that before the use of Standard Salt at least 50 per cent of the babies in Herisau were born with a definite, palpable, visible enlargement of the thyroid gland. In the last 3 years he has followed carefully 260 cases without seeing a single congenital goiter, the only prophylaxis being that the mother had used Standard Salt before and throughout the entire period of pregnancy. He further states that in 1922 in the 6-year old child the average thyroid gland surface was 26cm². This sank from year to year to 16, 11, 9, and in 1926 it was only 7cm². In children of the same age in goiter free zones it was 5-6cm².

In 1921, Dr. Muggia²⁸ started the prophylaxis of goiter in the district of Sondrio in northern Italy by giving once a week a $\frac{1}{4}$ gr. tablet of sodium iodide. His results were striking, as he was working in a district where the incidence of goiter is high. At the end of the school year in 1924 his tabulations include 51 communes, showing more than 18,000 pupils taking iodine (10 mg. chocolaines) regularly. In December, 1924, iodized cooking salt (one part in 100,000) was introduced as a prophylactic measure.

In 1925 iodized cooking salt was introduced into Derbyshire, England, and into New Zealand.

During this same period we have carried out goiter prevention in this country by various means. There being no federal commission in the beginning, the work was taken up by the various states according to the method which seemed best to meet their plan of education as well as prophylaxis.

In West Virginia, during the summer of 1922, the prevention of goiter was presented before many of the county teachers' institutes, and during the school year of 1922-23 more than one-third of the schools of West Virginia, city, village and county, carried out prevention by giving every girl and boy who volunteered 1 iodostarin tablet each week. The teachers were also telling them that goiter is a deficiency disease and that it is the easiest known disease to prevent. In general, they taught the people of West Virginia the cause of goiter and the fundamental principles of prevention.

During the same year, practically the same program of prevention and education was started in the schools of Grand Rapids, Mich. The next year, beginning in September, 1923, the state of Washington, with the supervision and direction of the State Health League, started the prevention in one school system in each county, either at the county seat or in an important city. Each child who volunteered was given 1 iodostarin tablet a week.

One of the most important surveys that have been made in this country was that carried out by the State Health Department of Utah in 1924. The first report shows that 71,201 school children were examined. Of these, 31 per cent of the boys and 54.4 per cent of the girls had goiter. By the end of that school year 10,000 children were carrying out the prophylaxis by the use of 10 mg. of iodine once a week, and this work has been extended very greatly since that time and will ultimately include the whole state.

New York has an endemic goiter problem in only 5 of her northern counties. The state health department has encouraged each county health department to carry on instruction as well as some preventive measure. Syracuse has given this instruction together with the opportunity for each child to get an iodostarin tablet (10 mg. of iodine) each week. The general use of iodized salt throughout these counties is now being urged.

In 1924 the Michigan State Health Department¹⁰ made a complete goiter survey of 4 counties of Michigan, beginning on Lake Superior with Houghton County and continuing with Wexford, Midland and Macomb in a diagonal line across the state. In addition, the iodine content of the water supply of each county was determined. Stated briefly, the incidence of goiter was found to be inversely proportional to the

quantity of iodine in the drinking water. In Houghton County, where 13,725 children were examined, it was found 58.1 per cent of the boys and 70.5 per cent of the girls had goiter. The iodine content of the water supply of this county was exceedingly low, a mere trace. In Wexford County, 47.6 per cent of the boys and 63.4 per cent of the girls were goitrous; the iodine content of this water was slightly higher than that of Houghton, being 50 parts per 100 billion. In Midland County, 24.4 per cent of the boys and 41.1 per cent of the girls were goitrous; the iodine content of the water supply of this county averaged 730 parts per 100 billion. In Macomb County, where the iodine content of the drinking water averaged 880 parts to 100 billion, the incidence of goiter was 20.1 per cent of the boys and 32 per cent of the girls.

Immediately after this complete survey, the state health department undertook the gigantic problem of educating the entire state by giving these facts, together with suggestions for the prevention of goiter. To this end an appropriate letter was sent to each member of the medical profession, to school authorities, and through the schools to the parents throughout the entire state. By coöperation among the salt manufacturers, the wholesale grocers and the state health department, it was agreed that after May 1, 1924, an iodized salt which should contain 1 part of sodium or potassium iodide to 5,000 parts of table salt would be sold throughout the entire state. This program has been carried out consistently, and it is estimated that in some counties up to 95 per cent of all the table salt used is the iodized salt.

We have had the opportunity of making a resurvey in Wexford County only. This was made in October, 1925, and showed that the incidence of goiter had decreased just 25 per cent in 18 months. The only method of goiter prevention employed in the county during this period was the use of iodized salt.

When the work was started in Akron, we had no standards to guide us, but we used the amount which we considered sufficient to saturate the thyroid gland and at the same time be well within the province of safety. The exact amount necessary to prevent goiter was being considered. From Marine's studies of physiological needs we estimated that approximately 200 to 300 mg. per year of iodine is used by the normal adult. It was from these estimations that we suggested the use of 10 mg. of iodine a week throughout the entire school year of 40 weeks. This is higher than the amount recently advocated by Breitner²² of Vienna, who concludes that, to meet the physiological needs of iodine and prevent goiter, each individual need have only 2 mg. of iodine a week, or 100 mg. a year.

Since McClendon²³ improved the method of determining exceed-

ingly small amounts of iodine in 1922, considerable work has been done on actually measuring and comparing the amount of iodine in the water and food in so-called goiter districts and goiter free districts. McClen-don has made sufficiently widespread determinations of the iodine content in the water supply to map out practically the whole United States according to a very low or a comparatively high iodine content in the water. The water of Lake Superior and the surrounding districts contains, according to accurate chemical analysis, approximately 1 part of iodine to 100 billion parts of water. By the same analysis the water in the lower Mississippi valley contains 10,000 to 15,000 parts of iodine to 100 billion parts of water, and some of the deep wells of Texas show more than 18,000 parts.

The iodine content of water is only a fair index to the iodine content of the food raised in these districts, and by careful estimations the iodine content of vegetables and grain is from 100 to 1,000 times larger in the so-called goiter free sections than it is in the Lake Superior region, which is one of the districts most severely afflicted with goiter.

By chemical analysis, McClen-don measured the iodine content of the food and drink of an average sized normal young man (goiter free) for a period of 3 days. He also measured the amount of iodine excreted by the body during the same period. The intake of iodine was 0.057 mg. and the amount excreted for the same period was 0.021 mg. From this we have a retention of 0.036 mg. in 3 days, or an actual retention of 0.012 mg. of iodine every day.

Von Fellenberg¹⁹ in Germany performed on himself an iodine metabolism experiment covering a long period. His food intake was at first not normal but intentionally low in iodine. In the latter part of the experiment iodine was added in the form of potassium iodide or cod-liver oil, sardines, watercress or butter. Von Fellenberg's low iodine diet contained 0.0143 mg. a day. He excreted about the same quantity. On adding iodine in various forms to this basal diet, he increased the excretion but not to the extent of intake, so that he obtained a positive iodine balance. From this experiment we find that the body uses up or excretes a definite amount of iodine regardless of the intake. We can state that an average sized young adult with normal metabolism and a minimal amount of physical exertion, all factors being reduced to a minimum, still excretes 0.0143 mg. of iodine daily. From the amount of iodine in the water and common foods of our goiter districts, McClen-don estimates it would require 10 years for a normal adult to accumulate 40 mg. from these natural sources. This 40 mg. is the average amount that Marine found in normal adult thyroids.

That endemic goiter may be prevented by the general use of a food

rich in iodine has been shown by Jarvis, Clough and Clark²⁰ in their study of goiter in the Pemberton valley, British Columbia. Endemic goiter and cretinism have been very prevalent among the white settlers and their domestic animals in this valley, yet no cases of goiter could be found among the inhabitants of an Indian village located on the same spot in this valley since many years before settlement by the white man. These authors conclude that the Indians, also their pigs, get sufficient iodine to keep their thyroids normal from the large amount of salmon that is annually consumed.

SALT AS A NATURAL SOURCE OF IODINE

During 1921-22 Hayhurst²¹ was pointing out that our common table salt has been the source of important food elements, especially iodine. He believes that our present-day methods of refining, whereby every trace of iodine is removed, have in some sections played an important part in the increasing incidence of endemic goiter. Convincing evidence of the truth of this teaching was found in our study made in West Virginia, more especially in the Kanawha River valley. In the spring of 1922, when surveys were made to determine the incidence of goiter throughout this section, we were told by several of the older physicians in Charleston that before 1900 endemic goiter was an exceedingly rare entity in this valley, but that soon after this date all the doctors had noticed a definite increase in simple goiter, and our survey of the schools of Charleston and Huntington showed that 60 per cent of the school girls had enlarged thyroids. This was indeed a challenging problem, and with the assistance of the state health department we found after considerable study that the condition as just stated was exactly true of the section, and that the only change in food or water was in the table salt. Until about 1900 all the table salt used in this valley came from salt wells in this region, and even today you can see along the river old shacks that 25 years ago marked a salt well. It is within the memory of every citizen 50 years of age that the table salt mined and used in this vicinity was a crude salt, described by everyone as being coarse and containing dirty brown particles. In 1898 the salt companies of Ohio and Michigan worked out and put into actual practice the new process of refining crude salt, as a result of which this whole section was within a few years flooded with pure fine white salt. Naturally, the local salt companies with their crude, dirty brown salt could not compete. As stated previously, the only change in food or water was in the supply of salt. It followed that within a quarter century the incidence of endemic goiter was as high in this valley as around the Great Lakes.

We find a similar interesting clinical study of prevention of goiter by the use of an original salt rich in iodine reported by Heinrich Bircher in 1875-80. His comparison of the incidence of goiter in different cantons of Switzerland was most striking. This study was interpreted more fully by H. Hunziker²² in 1915, from whom we get important data. He found that, from 1870 on, the chemists at the salt mines in the region of Bex (Switzerland) had made careful report on the iodine content of this salt, which is unusually rich in iodine. He also found that the canton of Waadt, either by accident or design, had obtained and still holds a complete monopoly of the salt from this district. Incidentally, the neighboring canton of Freiburg procured its salt from an entirely different source, which by actual analysis has shown little or no iodine since this period. The geology, the physical geography, the inhabitants and the foodstuffs in general in these 2 cantons are practically the same, the only difference being that for 50 years the canton of Waadt had used a salt which contains considerable iodine and the canton of Freiburg had used an iodine free salt. From the army statistics over this period, as shown in Table II, goiter has been 5 times as frequent in the canton of Freiburg as in the canton of Waadt.

TABLE II
RECRUITS UNFIT FOR SERVICE 1875-80
(FROM CENSUS REPORTS)

<i>Waadt</i>	Recruits	Goitrous	Per Cent	<i>Freiburg</i>	Recruits	Goitrous	Per Cent
Trey	20	0	0	Torny	18	4	22
Marnand	13	1	8	Chatonnave	23	5	22
Villarzel	20	1	5	Villarimboud	24	4	17
Villars Br.	11	2	18	Villaz St. Pierre	22	11	51
Dompierre	20	1	5	Lussy	16	9	55
Prevonloup	9	0	0	Tomont	110	32	29
Lovatens	15	2	13	Billens	13	2	15
Sarzens	5	0	0	Hennens	10	3	31
Brenles	14	1	7	Villaranon	6	3	49
Total	127	8	6		242	73	30

These two demonstrations from West Virginia and from Switzerland would indicate that in some sections practically our total amount of food iodine is from common salt. It further emphasizes the point that a very small amount of iodine, if used continuously, is able to keep the thyroid gland saturated and thereby prevent endemic goiter. The small amount of iodine that is estimated by McClendon and von Fellenberg as representing the basal needs of the body just about equals that which would be found in the crude salt cited above.

This relationship, as set forth by Heinrich Bircher in 1883 and by the recent studies of von Fellenberg under the Swiss Goiter Commission, has been the basis for the iodine content of the so-called Standard Salt which has been used in Switzerland since 1922. They estimated the average individual would use 5 kilos of salt in a year, or approxi-

mately 11 pounds, while in this country our best estimations have placed the amount used by each person at 7 pounds a year. Their Standard Salt contains 5 mg. of potassium iodid per kilo of salt, which would give in a year 25 mg. of potassium iodid to each individual using 5 kilos or 11 pounds of salt; while in Michigan an adult using 7 pounds of salt (1 part potassium iodid to 5,000 of salt) would get 10 grains of potassium iodid or 400 mg. of iodine, the same as a child getting one 10-mg. tablet a week.

Early in 1921, Sloan ²² advocated the use of iodized salt as a prophylactic, and suggested that one part to 5,000 be used. The immediate result of this suggestion was the introduction of a prepared salt prepared by a wholesale drug house and sold through the drug stores.

POSSIBILITY OF HARM

Since the beginning of preventive work in 1916 through the schools of Akron, we have recognized the possibility of harm, have constantly watch for any untoward effects in our studies, and have had our colleagues do the same. It was predicted by some in 1916 that we should have a regular epidemic of exophthalmic goiter.

This "epidemic" was discussed as long ago as 1858. As previously stated, there was in that year a symposium on the treatment and prevention of goiter before the Imperial Academy of Medicine in Paris. Dr. Rilliet of Geneva stated that he had for several years used iodized salt, one part of potassium iodid to 10,000 parts of cooking salt, following the teaching of Dr. Grange of Geneva. He had used this in the treatment of large goiters in many of his families, and at this time he is reporting 4 cases that presented what we would now diagnose as toxic adenomatous goiter. These were all of longstanding nodular goiters—3 women, age over 60 years, and 1 man age over 45. As Dr. Rilliet expressed it, these members of different families had attained in different degrees an ensemble of symptoms characterized by emaciation, palpitation, acceleration of pulse, general tremor, accompanied with great general nervousness and a marked diminution of strength. All of these cases were cured, however, by "rest, asses' milk and preparations of iron." Some years afterward, Dr. Rilliet goes on to say, the man of 45 passed many weeks at the seashore and was not slow to develop again the train of symptoms already described. He concludes that the patient's second intoxication was from the inhalation of iodine from sea air.

Dr. Rilliet's conclusions sound very much like some we have heard within the last year: (1) The long continued absorption of small doses of an iodine salt mixed in the water, air or food is not always without

danger. (2) The inhabitants of certain localities are more than others exposed to iodine intoxication. (3) This special susceptibility depends perhaps on the small quantity of iodine one receives from the water, the air or the food in these countries. (4) Iodine intoxication is perhaps more likely to do harm when the medicine is given in small doses than in large doses and as a preventive than as a cure of a local and confirmed diathesis.

At the next meeting of the Imperial Academy of Medicine at Paris, October 26, 1858, Dr. Boinet of Paris addressed the Academy in a letter on "Food Iodine—The Intoxication Shown by Dr. Rilliet (of Geneva) Has Never Existed." He accused his colleague of being imposed upon by the "axiom which often misleads, that *post hoc, ergo propter hoc*." He was also impressed by the fact that only 4 cases had been reported from a country where goiter was very frequent. Since Rilliet states that he had treated many families with iodine, and several of his colleagues were so treating many goiters, why should we see only 4 cases reported? Suffice it to say that this argument was not decided, and has been given here to show the futility of just such arguments within the past year.

After this discussion, the fear of possible danger to a few seemed to carry much more weight than the evidence of benefit to the many, and by 1870 the relation of iodine to thyroid enlargements was practically discredited or forgotten. Now, however, with the background of 40 years of scientific investigation, together with the definite results being reported in Switzerland with their Standard Salt and the data already collected in this country from the use of much larger amounts of iodine, it would seem that the prevention of goiter is on a scientific and safe basis. However, we are seeing reports in our medical literature of cases of exophthalmic goiter in persons who had previously used prophylactics such as iodized salt, and they are spoken of as exophthalmic goiters caused by the use of iodine in these small amounts, without a true appraisal of all the other factors that have been considered etiologic for the past 50 years. The ease with which this fallacious conclusion can be made was emphatically called to my attention during the reexamination of the children of Marion County, O., in October, 1926. Two girls, age 14 years, with moderate-sized, nodular goiters, were seen who on examination in 1925 had been classed as having moderate-sized congenital goiters. They had both used iodized salt during the entire year, and now showed every evidence of rather severe hyperthyroidism. On further investigation, however, it was found that one had been taking thyroid extract since March, 1926. (7 months), and the other had been started on Lugol's solution in July and after

this had used iodex ointment freely on the neck once a day. This proves nothing against the prevention of goiter, but shows the dangers of careless treatment.

In the work in Akron, if you will consider 2 gm. of sodium iodid over a period of 2 weeks as 1 treatment, then we gave more than 10,000 treatments, and the total of bad results was 10 cases of mild iodid rash with never any symptoms of hyperthyroidism.

In Switzerland, from the use of iodostarin in some cantons for as long as 8 years and the general use of iodized salt in several cantons for 4½ years, Dr. Eggenberger states they have not seen a single case of harm that could reasonably be credited to the general use of iodine in the effort to prevent goiter. In 1926 he made a special study " of the few cases in which it was reported that harm had been done by the prophylaxis, and gives this summary: "In Canton Appenzell A.Rh., with under 55,000 inhabitants, in 4½ years there has not come into view a single case of harm from the use of iodine through governmental iodized salt for cooking, although I follow each doubtful case which is mentioned to me by my colleagues. It would be instructive to go through the many sources of error which lead falsely to the diagnosis of iodism. The most interesting was the panic anxiety of a certain person who already had gastric symptoms and palpitation from the salt before it was iodized. In the Swiss statistics there figures a case of alleged death produced by the use of iodized salt in which case it was later known that the patient never had occasion to get iodized salt."

Dr. Muggia reports no bad results from the use of 20 mg. of iodine weekly, and at the close of the school year in 1924, 10,000 children were taking this amount systematically.

Briefly, we have never seen an authentic case of hyperthyroidism in children that could by any stretch of the imagination be attributed to the prophylaxis of goiter through the schools. This point seems agreed upon by all. However, the old argument about longstanding goiters in adults put forth by Rilliet in 1858 seems to live on.

In an attempt to answer the question, a large number of hyperthyroidism cases were studied for a history of iodine intake before onset of symptoms or as treatment for simple goiter. All these cases were seen in the Cleveland Clinic in 4½ years, from March, 1921, to September, 1925. During this time 2,659 cases of hyperthyroidism were studied, and all who had used iodine in any form previous to any symptoms or as treatment for simple goiter by physicians, were listed as cases of induced hyperthyroidism. This report by Kimball " was published in the *Journal of the American Medical Association*, November 28, 1925, with the summary given in Table III.

TABLE III

INDUCED HYPERTHYROIDISM

Total number of cases of hyperthyroidism	2,659
Total number of cases of induced hyperthyroidism	309 (11.6%)
Induced by:	
Iodized salt	6 (2%)
Self-medication	37 (12%)
Medical treatment	266 (86%)

It was stated in the article, but with insufficient emphasis, that during this study we had seen many cases of middle age women with long-standing nodular goiters that had developed hyperthyroidism with exactly the same history as the 6 listed in the foregoing table under "Iodized salt," only they had never used iodized salt or any iodine. Therefore, in the case of the 6 the iodine they received from iodized salt is not necessarily an etiological factor; their having used iodized salt and later developing hyperthyroidism is probably only a coincidence.

In the past 6 months we have studied 33 cases of severe exophthalmic goiter, and of this number only 5 had ever used any iodized salt. These 5 responded to the use of large amounts of iodine, such as 500 mg. daily, exactly the same as the 28 others. Also the same factors—focal infection, shock, exhaustion and the history of adenomatous goiter—were to be considered in the 5 as in the 28. And further on this point, Dr. Allen Graham from a close study of the surgical goiter cases in Lakeside Hospital states he has never seen a case where he could say with any satisfaction that the hyperthyroidism was a result of iodine in amounts used in general prophylaxis, especially in iodized salt.

By emphasizing the tremendous harm this public health measure has suffered from unscientific articles in which personal opinion has been given instead of scientific data, we commit ourselves to a program of real investigation to learn the truth of the situation. As a result of surveys, iodine determinations, teaching and encouragement from the State Health Department in Michigan since 1923, we have in Michigan more basic information than anywhere else in the world. If all this information were available, no doubt our big questions would be answered by indisputable figures. Therefore, the next important step is getting and correlating this information.

CONCLUSIONS

Every survey or study only emphasizes the importance of prevention during pregnancy. The relation of these congenital defects to the adenomatous or tumorous conditions of later life is more and more appreciated with each careful study. We all know the disappointments in our attempts to control or treat these tumorous thyroids. Therefore,

we cannot stress this point too strongly, and in endemic districts we need the assistance of all prospective mothers and of the physicians who educate and direct them through this important period. It is during pregnancy that the general use of iodized salt is of greatest value. For those under the supervision of their physicians or those who accept the responsibility themselves, one or two iodostarin tablets a week throughout pregnancy and lactation would be excellent.

The history of this problem for the past hundred years teaches most emphatically that the treatment of goiter is very unsatisfactory and accomplishes little toward the control of the disease. Those attacking the problem from the viewpoint of preventive medicine—physiologists, biochemists and public health organizations—have accumulated sufficient evidence to justify the assertion that endemic goiter is the easiest known disease to prevent. By further detailed study of the fundamental principles underlying the cause and prevention and with the constant application of scientific data by the state health organizations, we should see the fulfillment of our prediction: Within another generation there will be no endemic goiter problem.

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Bacterial Flora of Ground Market Meats*

Outbreak of Food Poisoning Probably Due to Crabmeat

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A BANQUET on September 23, 1926, was attended by approximately 1600 members and guests of a Florists' Association at a large hotel in Chicago. A few hours after the banquet some of the guests became ill. Within 24 hours a large number were affected. The symptoms were abdominal cramps, diarrhea, headache, and in some instances nausea and vomiting.

The Department of Health was not notified of the occurrence until September 26, three days later, when an investigation was begun to determine the causative agent. At this time many of the guests had left the city, a fact which rendered it difficult to estimate definitely the number taken sick.

A list of the guests at the banquet was obtained from the local branch of the association; among them were approximately 90 persons who lived in Chicago, and from these, data regarding the number who became ill, the symptoms, the articles of food eaten and not eaten by those who were ill, were obtained.

The data indicated that between 50 and 60 per cent of those present were ill. The information on this point, however, was conflicting. At the same time 1000 guests, not at the banquet, were being served at the hotel. None of these were taken ill. Moreover the hotel management reported no illness on the part of the waiters and other help, a great many of whom had partaken of food served at the banquet.

From the initial survey of the symptoms of some patients, it was decided that the outbreak was probably one of food poisoning. In order to ascertain the probable cause of the outbreak the following procedure was carried out:

* Read at a Joint Session of Laboratory and Food and Drugs Sections of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 17, 1927.

1. All those who had prepared and served the food were required to submit to examination by the Department of Health. The results of these examinations indicated that none of the personnel of the hotel were carriers of pathogenic intestinal organisms.

2. A list and history of all the foods served at the banquet was obtained. This was checked against the previous list of foods eaten and not eaten by those taken ill and those not taken ill, obtained from the 90 guests living in Chicago. The survey brought out the fact that the food had been properly prepared and handled in the hotel. It showed that most of those who were not sick had not eaten the sea food canape (containing crabmeat); whereas, those who were sick had partaken of it. It was evident, however, that if the sea food was at fault, not all of it was contaminated.

3. Samples of several of the lots of foods served at the banquet were obtained and examined at the laboratories of the Department of Health. These foods included crabmeat, ripe olives, pineapples, jelly, mushrooms, drinking water and charged water. All save the crabmeat, consistently gave negative results both chemically and bacteriologically. The crabmeat, however, yielded an organism, which on preliminary examination appeared to belong to the *Salmonella suipestifer* group. Members of this group are known to be occasionally associated with food poisoning. It is generally believed that this type of organism is of animal origin and gets into food through contamination by rats, mice, etc.

The organism on further and careful study was found to have the following properties:

Morphology—It was small, Gram negative, non-sporeforming, and sluggishly motile.

Agar Slant—It gave a moist, smooth, translucent, and abundant growth.

Broth—The medium became turbid; there was a thin pellicle and some sediment.

Litmus milk—The medium became acid in 24 hours, and alkaline in 48 hours.

Indol—The test was negative.

Gelatin—Gelatin did not show liquefaction.

Sugars—Dextrose, maltose, mannite, galactose, trehalose, xylose and dextrin were fermented with production of acid and gas.

Arabinose, levulose, and rhamnose were fermented with acid production but no gas.

Adonite, erythrite, inosite, inulin, lactose, melezitose, raffinose, salicin, and sucrose were not fermented.

Culturally the organism resembled the *Salmonella suipestifer* very closely.

In order to ascertain more fully whether the organism might be *S. suipestifer*, it was tested against *suipestifer* antigen obtained from the University of Chicago and against antisera from rabbits injected with pure cultures of *S. suipestifer*, obtained from the University of Chicago and from the American Type Culture Collection. Six such strains were used to immunize rabbits and yielded sera of high homologous titre for all save one strain. None of these antisera would agglutinate the crabmeat organism. Immune antisera, obtained by injecting washed cultures of the crabmeat organism, failed to agglutinate the pure live strains of *S. suipestifer*. However, the organism was agglu-

minated by its own homologous antiserum in high dilutions. The results throw doubt upon the theory that the organism is definitely a member of the *S. suispestifer*. However, some workers have found that there are certain strains of this group of *Salmonella* which do not agglutinate with heterologous antisera of the species.

To test the pathogenicity of the crabmeat organism on laboratory animals the following experiments were carried out:

The organism was grown in dextrose broth at 37°C. for 24 hours; 1 c.c. of the culture was then injected intraperitoneally into mice. Death occurred within 48 hours in 4 of the 6 mice injected. None of the control mice died. Injections of washed suspensions of the organism also resulted in the death of 5 out of 8 mice in 48 hours. The organisms were then grown in a veal infusion broth containing 2 per cent of Witte's peptone, and 0.1 per cent of dextrose with a final pH of 7.2.

Injection of the cultures, filtrates and washed organisms grown in this broth, all resulted in the death of a high percentage of the mice when 1 c.c. was injected.

Again experiments were tried using Berkefeld filtrates heated to 56°C. for 30 minutes. The heated filtrates did not cause the death of the mice injected.

Some of these results were suggestive of a soluble toxic substance. In order to determine whether we were dealing with a true toxin, attempts were made to obtain protective sera against the filtrate of these organisms. It has been shown by Ecker,¹ Geiger, *et al.*,² and Branham³ that members of the paratyphoid-enteriditis group produced soluble toxin-like substances.

Rabbits were therefore injected intravenously at frequent intervals with sterile filtrates of the "crabmeat" organism.

The antisera from these rabbits failed to protect mice injected with the unheated filtrates.

While this work was in progress another investigation was being carried out on the flora of ground meat obtained in the Chicago market. These organisms were isolated by streaking a portion of the sample of ground meat upon the surface of Endo's medium, incubating the plates for 24 hours at 37° C. and picking the colorless colonies from the surface of the medium. The colonies so picked were purified by repeated seeding in fluid Endo's agar at 45° C. and pouring plates for the deep colony method of isolation.

The properties of the 100 organisms thus obtained were studied in the following media: tryptophan water for 5 days at 37° C. to determine indol production, 14 per cent gelatin for 30 days at 20° C. for

FERMENTATIVE REACTIONS

Type of Organism	Gram Stain	Motility	Gelatin	Indol	Dextrose	Lactose	Sucrose	Xylose	Dulcitol	Mannitol	Rhamnose	Maltose	Inositol	Salicin	Litmus Milk	Laboratory Numbers
B. <i>Suispestifer</i> group	—	+	—	—	*	—	—	*	—	*	*	*	—	+	±	1-2-5-7-10-11-14-22-30-31-35-51-61-65-69-74-76-80-81-82-85-89-93-94-95-96-100. 4-21-25-32-34-49-52-84. 8-13-17-20-24-37-38 41-43-44-45-46-48-58-60-64-70-72-75-77-86-88-90-91-92-98-99. 36-47.
B. <i>Icteroides</i> group	—	+	—	+	*	—	—	*	*	*	*	—				
B. <i>Proteus</i> group	—	+	+	+	*	—	*	—	—	*	—	*		+		3-6-9-15-16-33-39-54-59 66-71-78-83-97. 27-28-56. 26-73. 53. 19-29. 40-68. 42. 57-62-63-87. 12-18-50-55-67-79.
	—	+	+	+	+	+	+	—	—	+	—	*		+		
	—	+	+	+	*	—	*	*	—	—	*	*		+		
	—	+	+	+	*	—	*	*	—	—	—	*		+		
	—	+	+	+	*	—	+	+	—	+	—	+		+		
	—	+	+	—	*	—	*	*	*	*	*	*		+		
	—	+	+	+	*	+	—	*	*	*	*	*		+		
B. <i>Cloacae</i> group	—	+	+	—	*	*	*	*	*	*	*	*		+		
	—	+	+	—	*	*	*	*	—	*	*	*		+		

+ indicates acid production or positive reaction.

* acid and gas production.

— negative reaction.

± initial acidity, final alkalinity.

Culture 23 proved to be a gram negative Coccus.

proteolytic enzymes, litmus milk and various 1 per cent carbohydrate media for fermentative changes. The reactions were read in litmus milk in 5 and 15 days, while in the carbohydrate media the results were read at the end of 5 days of incubation at 37° C.

Sixty-two organisms of the 100 selected for study agreed substantially in their cultural reactions with the *S. suispestifer* group while 2 gave reactions similar to *Salmonella icteroides*. The remaining organisms were classified in the *B. proteus* and *B. cloacae* groups.

The organisms tentatively classified as *S. suispestifer* failed to agglutinate with a known *S. suispestifer* antiserum of high titre. The known *suispestifer* organisms likewise failed to show specific agglutination with antisera prepared from 2 of the unknown organisms.

These studies combined with the work of Geiger, Ward and Jacobson 'on oysters, carried out in this laboratory indicate that there are a number of organisms associated with various foods, but particularly meat products, that are members of the paratyphoid-enteriditis group. Many of them do not lend themselves to classification with any of the better known organisms. Others fall in the classification of the *B. proteus* or *B. cloacae* group. The presence of any of these groups seems

to indicate unsatisfactory sanitary methods of handling of the foods in question and may be responsible for the outbreaks of gastrointestinal nature.

The rôle of these organisms in food poisoning outbreaks has not been definitely determined, but it is apparent that they are potentially dangerous, for it is well known that several of the better known bacteria of these types do cause food poisoning outbreaks.

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The Growth of the Birth and Death Registration Areas*

IN 1924 the slogan was evolved "Every State in the Registration Area Before 1930." When this slogan was first used, there were 31 states in the birth registration area and 38 in the death registration area. In 1925, at St. Louis, a special committee of the Vital Statistics Section was appointed, with Dr. Dublin as Chairman, to aid in the completion of this task.

There has been excellent coöperation everywhere, and as a result of the united efforts of federal, state, city, and welfare agencies of all kinds, not overlooking contributions of over \$30,000 from the insurance companies and the Rockefeller Foundation, there are today 40 states in the birth registration area and 42 states in the death registration area. The following 6 states are still outside of the death registration area: Georgia, Nevada, New Mexico, Oklahoma, South Dakota, and Texas. The 8 states still outside the birth area are the 6 just mentioned and Colorado and South Carolina.†

Registration promotion campaigns have just been completed in Oklahoma and Georgia, and these 2 states are now being tested officially by the U. S. Census Bureau to ascertain whether they are registering at least 90 per cent of their births and 90 per cent of their deaths. Other campaigns are now under way in Colorado, South Carolina, and Texas. New Mexico is just ready to start a drive, and we are hopeful

* Report of the Committee to Aid Completion of the Registration Area before 1930, delivered before the Vital Statistics Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 19, 1927.

† Georgia and Oklahoma have recently been admitted to both areas.

that slight modifications will be made in the registration laws of Nevada and South Dakota at the next sessions of the state legislatures in 1929, so that these states will be able to qualify for admission during that year.

Briefly stated, a successful registration promotion campaign requires two things: (1) A diagnosis of the trouble, and (2) the application of proper remedies.

Diagnosis—A careful study is made of existing conditions in the state in an endeavor to locate the registration defects, whether connected with the state office, the local registrars, or with the physicians and midwives, and to determine whether there is any lack of public sentiment in favor of better registration. Unusually low birth rates or death rates in any section of a state immediately suggest defective registration, though further investigation may prove that such rates are due to other causes.

The names of many delinquent physicians and midwives are suggested by noting in the official registration records that for many infant decedents records of births have never been filed. Many delinquents are revealed by checking against the official birth records independent lists of recent births—lists obtained from the official test cards returned to the Census Bureau and from information given by mothers at county fairs, or from information obtained by women's clubs as a result of a house to house canvass, or from cards obtained by the school census enumerators.

Remedies—Under the direction of the state commissioner of health are gathered together as many capable campaign workers as possible from state, federal, and volunteer welfare agencies. These workers then go to those parts of the state which have shown most defective registration, and endeavor to convert the delinquent registrars, doctors, midwives, and others to a realization of the importance of good registration. While making such tours the campaign workers actually collect hundreds of birth records which have never been filed.

Where publicity is needed, posters are put up in the post offices; articles are written for the press; and the chambers of commerce, the Boy Scouts, and welfare agencies are called upon for help.

In terms of population 87.3 per cent of continental United States is now included in the birth registration area and 91.3 per cent in the death registration area. In terms of area, this would be 72 per cent and 76.5 per cent.

If the task ahead is considered in terms of population, the goal does not seem so far away, but when one realizes that 28 per cent of the land area is still outside of the birth registration area and that 23.5

per cent outside of the death registration area, the magnitude of the task ahead is very evident. In a word, the few states still outside are on the whole so thinly populated that tremendous distances must be covered to reach the people and to sell to them the idea that the registration of births and deaths is desirable. Texas alone is bigger than the combined area of the following group of 13 states: the New England states, New York, Pennsylvania, New Jersey, Delaware, Maryland, West Virginia and Virginia, and the land area of the other 7 states still outside the birth registration area is considerably greater than twice the land area of Texas. A realization of this tremendous area still to be brought within the fold in the short period of two years, will convince anyone that our only hope of reaching the goal on time rests upon the full coöperation of every agency. More workers and more funds are needed.

LOUIS I. DUBLIN, *Chairman*
WILLIAM H. DAVIS
WILMER R. BATT

FREDERICK L. HOFFMAN
BLANCHE M. HAINES
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Child Welfare in Mexico

THE Government of the Federal District of Mexico began in October to publish a monthly periodical, *El Nino* (The Child), devoted to child welfare. The periodical consists of four sections, which deal respectively with medicine, including pediatrics and hygiene; psychology, including vocational guidance; education; and social welfare.

THE insanitary conditions under which the children of the poorer classes in Mexico City are living have attracted the attention of the Department of Health of that city. The department has ordered its inspectors to visit all homes, particularly those in the working-class suburbs, in order to investigate the living conditions of the children. Measures for the improvement of the situation will be taken according to a plan prepared by the Department.—*El Nino*, Mexico City, vol. 1, No. 2, 1927.

Bacterium Abortus Infection in Man*

The Results of the Agglutination Test Applied to More Than
10,000 Human Sera

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and

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SINCE the work of Evans (1918) proved the close relationship between *Bact. abortus* and *Bact. melitensis*, the possibility that *Bact. abortus* might be pathogenic for human beings has been constantly present in the minds of many investigators. During the past two years approximately fifty cases in which *Bact. abortus* has been incriminated as the causative factor have been reported in the United States. In all these patients, the characteristic symptom has been an intermittent type of fever somewhat resembling typhoid. Very recently one case of infection of the genitourinary tract of a woman has been cited by Belyea (1927).

For several years, the Storrs Agricultural Experiment Station has tested by the agglutination and complement fixation reactions a large number of dairy herds in this state. From the data so obtained, it appears that at least 90 per cent of the herds are harboring *Bact. abortus*. Since the mode of spread of this type of disease has been assumed to be through the ingestion of raw milk from infected cows, it would seem that if the organism itself were pathogenic there should be a fairly large number of human beings in the general population infected with the disease. These may have been diagnosed as suffering from other clinical entities, but the agglutination test applied as a routine procedure in a large number of human sera should give more information on this point.

METHODS

The only method which seemed feasible was the application of the agglutination test using a *Bact. abortus* antigen to the human sera

* Read before the Laboratory Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 20, 1927.

which were received at the State Department of Health, Bureau of Laboratories, for the Wassermann reaction. Bassett-Smith (1925) tested 130 Wassermann samples in England and found two sera giving positive agglutination in 1 in 40. The objection which might be advanced that these samples coming from persons who showed no real clinical symptoms of *Bact. melitensis* infection might negate the results of the experiment, of course, is valid, but inasmuch as it seemed impossible to obtain numerous sera by any other means, it was the method employed in this work. The results obtained should give some idea of the number of persons in the general population of Connecticut whose sera react to the agglutination test.

The serum was separated from the clot as soon as it was received at the laboratory and after the Wassermann and Kahn reactions were run, it was preserved in the icebox until the agglutination test could be performed. Any samples showing bacterial growth or a large amount of hemolysis were discarded. The antigen employed was made from four strains of *Bact. abortus* coming from different sections of the country whose agglutinability had been carefully checked. These strains were grown for 24 hours on 1 per cent glycerin Fairchild's agar, and from these, transplants were made upon plain Fairchild's agar and incubated for 48 hours at 37°C. The growth was harvested with a small amount of 0.4 per cent carbolized physiological saline and diluted for the final test to a nephelometer 1 on the MacFarland scale. This diluted antigen was distributed in small test tubes in 2 c.c. amounts and the serum added to make final dilutions of 1 - 25, 1 - 50, 1 - 75, 1 - 100. After the addition of the antigen the tubes were carefully corked and shaken, incubated for 48 hours at 37°C. and one reading was made on their removal from the incubator and a second after 24 hours at room temperature. The results were recorded on the 4+ scale, i.e., 4+ indicating complete flocculation and clearing, 3+ and 2+ indicating partial reactions and 0 a non-reactor.

Inasmuch as the names of the patients for the Wassermann reaction cannot be divulged, a number system was used on all samples. Whenever a serum showed 4+ reactions through the 1 - 100 dilution a questionnaire was sent out by the State Commissioner of Health to the attending physician. This asked for the sex, age, and occupation of the patient, a description of the symptoms, whether he had used milk either raw or pasteurized; and requested a second sample and, if possible, a blood culture. Whenever a second sample was received, the dilutions were increased to 1 - 200.

From November, 1926, to July, 1927, a total of 10,157 human sera were tested. Of this number 63, or about 0.6 per cent, showed practic-

ally a complete reaction in the four dilutions used and questionnaires were sent to the attending physicians in all but 1 case. Up to date answers have been received from 38 of these and second samples were run on 14. Only one of these showed no reaction by the agglutination test.

There were 21 males and 17 females in the 38 cases in which more or less complete data are at hand. Of the 17 women, one was in the hospital for parturition, 3 had previously suffered from two or more abortions, and 1 was diagnosed as having uterine ulceration. These 5 cases are significant if Belyea's work on the infection of the genitourinary tract is considered.

The questions on the source and amount of the milk ingested were answered sufficiently for analysis in 29 of the 38 questionnaires. Eighteen of the persons who exhibited a strong reaction to the agglutination test had partaken of raw milk. Of these, 7 ingested cow's milk only occasionally, 5 partook of it in large quantities and 6 were moderate users. Only 5 of the cases used pasteurized milk and in 6, the source of the milk was unknown.

Of the remaining 10,094 samples, 103 showed a partial reaction in three or more dilutions, 94 in the 1-25 and 1-50 dilutions and 157 in the first or 1 - 25 tube only. No questionnaires were sent on these sample numbers because it was believed that many of these might be non-specific reactors.

Although in 5 cases blood cultures were made, the results were negative. It was impossible to follow most of these patients very far since only a few of them were in the hospitals, and many had left the care of the attending physicians before receipt of questionnaires.

DISCUSSION

The experimental data presented here must be considered as merely a preliminary report. It was designed to gain some idea, if possible, of the prevalence in the general population of persons whose sera reacted in fairly high dilutions to the agglutination test with *Bact. abortus* antigen. The fact that these sera were not selected but were taken as a matter of routine by some hospitals and also from patients for suspected syphilis gives some added significance to the results obtained.

There has been up to the present, no agreement as to the dilutions which are significant in indicating the presence of living *Bact. abortus* organisms in the human body. The dilutions employed in this work were merely empirical, and it is doubtful from the results obtained if the 1 - 25 and 1 - 50 dilutions give more than non-specific reactions. This is borne out by the fact that no blood cultures were obtained even in those reacting through the 1 - 100.

There are several possible explanations for the presence of agglutinins for *Bact. abortus* in human sera. First, the patients might be harboring an active focus of infection with *Bact. abortus* and the antibodies would be constantly formed under the stimulation of the growing bacterial antigen. In these cases, it would be expected that reactions to the agglutination test would be in fairly high dilutions and consistent. The persons themselves would either exhibit symptoms of undulant fever or they might remain normal as so often happens in carrier states in typhoid. Second, agglutinins might be present in large quantities in cases recently recovered from an active infection with *Bact. abortus*, but these reacting bodies would gradually disappear and the subsequent test should become weaker. Third, agglutinins for *Bact. abortus* are present in large quantities in the milks of some cows and persons ingesting these milks in moderate amounts might react to the test owing to the passive absorption of these reacting bodies into the blood stream. This last reaction would be transitory unless the milk drinking was continued over a long period. The fact that no positive blood cultures were obtained does not necessarily indicate that persons of the first class were absent in this survey inasmuch as one negative blood culture does not preclude the presence of *Bact. abortus* in an individual.

The results indicate that only about 0.6 per cent of the sera tested show a complete reaction in the 1 - 100 dilution. Of these, only a relatively small number showed any symptoms which simulated those of Malta fever. Approximately 1 per cent gave a partial reaction through the 1 - 75 dilutions and 1.5 per cent in the 1 - 25 dilution which may or may not have been specific in this case. Therefore, provided that the agglutination test has any significance, the number of persons in the general population infected with *Bact. abortus* must be relatively small. Hull and Black (1927) found approximately 7.3 per cent of the 69 patients who consistently gave negative Widal reactions but had characteristic fever symptoms reacted to dilutions of 1 - 200 or better by the *Bact. abortus* agglutination test. These samples, however, were selected because of certain symptoms and do not give an idea of the prevalence of the disease in the general population.

It is significant that from 29 questionnaires in which data were given on the source of the milk supply, that 18, or about 62 per cent of the reacting persons, were users of raw milk and only 18 per cent had ingested pasteurized milk. The source of the milk in 20 per cent of the cases was unknown and it is very probable that at least 50 per cent of these used raw milk. This fact should give an added reason for pasteurization of milk from tuberculosis free herds, but with the present

state of our knowledge on the value of the agglutination test and the relatively small numbers of the individuals involved as indicated by these results, it does not seem wise to enforce compulsory pasteurization of the products from abortion infected farms.

SUMMARY

1. Ten thousand, one hundred fifty-seven samples of human sera which were submitted for the Wassermann examination were tested by the agglutination reaction using *Bact. abortus* as the antigen. Of this number, approximately 0.6 per cent gave reactions up through the 1 - 100 dilution. These results obtained in a state where preliminary testing has shown at least 90 per cent of the dairy herds to be infected with *Bact. abortus* and approximately 60 per cent of the milk only is pasteurized, indicates that infection of man with the bovine type of *Bact. abortus* is relatively rare, provided any significance can be attached to the agglutination test.

2. Attempts to follow the small number of cases reacting through the 1 - 100 dilution by the agglutination test were made through questionnaires, subsequent testing and blood cultures. This method was unsatisfactory on the whole inasmuch as many of the patients remained under the care of the attending physicians for only a short time.

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Measures Against Adenoids in Rome

AS a part of its campaign against adenoids, the government of the province of Rome established early in 1927 the first institute for the free treatment of adenoids. This institute is open to school children and young people. Soon after its establishment a special film on adenoids was prepared; it is loaned to private and public agencies. Later in the year circulars were sent out to the larger public child welfare agencies directing them to take measures for the treatment of adenoids among the children in their care. The National Bureau of Public Health is cooperating in this campaign by distributing literature on adenoids among the school teachers throughout Italy.—*Difesa Sociale*, Rome, Jan., 1928, p. 23.



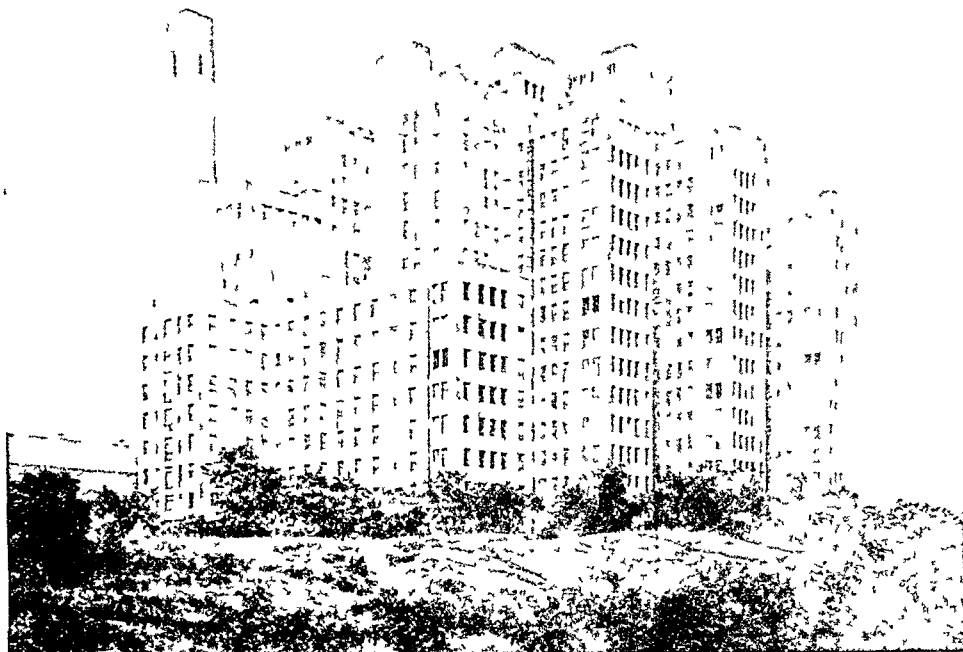
H. Armstrong Roberts

The Joy of Childhood



High School Girls Learning About the Care of Babies in Murfreesboro, Tenn.

Courtesy Child Health Demonstration Committee



*Medical Center in
New York Recently
Opened*



*May Day—Child Health Day
in Angleton, Tex*

Courtesy American Child Health Association

*Seventh Grade Stu-
dents in Athens, Ga.,
Learn About Diet
by Experimenting
with Rats.*



Courtesy Child Health Demonstration Committee

The Age Distribution of Communicable Disease According to Size of Community*

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THE lack of adequate tabulations of morbidity statistics in the United States has been felt probably by every worker in the field of practical epidemiology. For the most part, our knowledge of the prevalence, by age and sex, of the common communicable diseases rests upon hospital statistics, the published reports of a few city health departments, and occasional articles in professional journals. The neglect fully to utilize available morbidity data is in striking contrast to the work expended on mortality statistics with resulting enormous annual waste of collected material.

Morbidity reports are looked upon usually as being merely for the purpose of notification in order that the proper authority may take suitable action to prevent the immediate extension of the disease. It is not generally appreciated that they have a further value as a guide in devising or revising methods of control, and that they furnish a useful ground work for the intensive study of particular material under special conditions.

For the past seven years the Division of Communicable Diseases of the New York State Department of Health has been engaged in tabulating by age and sex, the morbidity and mortality for typhoid fever, scarlet fever, measles, whooping cough, diphtheria and poliomyelitis for the years subsequent to 1914. The tabulations show the gross morbidity, by small groups of communities classified according to population, and so far as good data were available, the age and sex incidence for each group, and according to the month in which the case was reported to the department. The deaths have been similarly classified except that they are given for the month in which they occurred. Unfortunately we have no data as to the age and sex incidence of these dis-

* Read at a Special Session on Preventive Medicine and Epidemiology, of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 18, 1927.

eases in New York City or for cities of 20,000 and over, prior to 1918. Even since 1917, the reports from the cities of 200,000 to 1,000,000 have been so incomplete as to age and sex that their tabulation by these items was discontinued. We are now receiving, however, tabulated reports from the city of Buffalo, and in time these will afford a useful basis for comparison. The grouping of the various communities of the state according to their population was suggested by the material differences in the death rates of the urban and rural areas for the diseases under consideration as shown by mortality statistics from various sources, examples of which are shown in Table I.

TABLE I
AVERAGE URBAN AND RURAL DEATH RATES 1911-1920
REGISTRATION AREA AND NEW YORK STATE

	Typhoid		Measles		Scarlet Fever		Pertussis		Diphtheria	
	U	R	U	R	U	R	U	R	U	R
Registration area*	11.6	15.8	9.7	8.6	6.0	3.8	9.6	11.4	19.3	13.0
New York State	7.2	8.0	10.4	5.0	5.9	2.9	8.1	7.0	20.9	7.8

* Mortality Statistics, 1920 "Urban" = cities in registration states; "rural" = rural part of registration states.

Climatic and racial conditions, no doubt, constitute an important factor in the variations shown by federal statistics. For example, the urban population of the registration area is predominantly northern, the rural, southern and western. Diphtheria and scarlet fever ordinarily show higher death rates in the north than in the south and typhoid fever lower. Hence diphtheria and scarlet fever might easily be classified as an "urban" and typhoid as a "rural" disease without there really being anything more than climate as a causative factor. For the statistics of New York State, however, climatic differences are of little importance, and since in the main they correspond with the federal statistics so far as the diseases in Table I are concerned, it is to be inferred that there are essential differences between urban and rural communities which bring about this result. However, it was known, for example, that the favorable urban typhoid rates for New York State were due to the influence of the low New York City rates for this disease; that this New York City rate concealed an actually higher urban than rural rate in the remainder of the state. It seemed not unlikely therefore that within the broad classifications of "urban" and "rural" there also might be concealed conditions tending to high rates from communicable diseases whose recognition might enable us to concentrate our attack with better results for the effort expended.

Furthermore, the morbidity statistics formerly published by the Pennsylvania State Department of Health showed rather constant differences in the age distribution of urban and rural cases of scarlet fever and diphtheria, and it seemed desirable to ascertain whether these

TABLE II

COMPOSITION AND CHARACTERISTICS OF POPULATION, NEW YORK STATE
EXCLUSIVE OF NEW YORK CITY

By PLACES GROUPED ACCORDING TO POPULATION

Size of Community	No. of places in group	Total	AGE DISTRIBUTION				
			Under 5	5-9	10-14	15-19	20 & over
State (exc. N. Y. C.)	1,456	4,818,348	454,370	440,397	411,969	367,640	3,143,972
200,000-1,000,000	2	783,666	79,470	72,574	63,478	59,972	508,172
50,-200,000	8	720,529	68,234	63,703	58,291	53,701	476,600
20,-50,000	17	513,005	46,785	45,356	42,527	40,130	338,207
10,-20,000	31	390,951	37,806	35,112	32,643	30,035	255,355
5,-10,000	32	235,917	23,098	22,084	20,192	18,549	151,994
2,500-5,000	83	288,955	26,092	25,836	25,193	21,911	189,923
Under 2,500, Inc.	354	360,038 }	172,885	175,732	169,645	143,342	1,223,721
Unincorporated towns	929	1,525,287 }					

AGE DISTRIBUTION

OTHER CHARACTERISTICS OF POPULATION

	Und. 5	5- 9	10- 14	15- 19	20 & over	Percent of Native White of Native Parents	Percent of Females 20-44 Foreign Born	Illiterate 10 & 21 & over	Families per dwelling	Persons per dwelling	Persons per family
State (exc. N. Y. C.)	9.4	9.1	8.6	7.6	65.3	52.6	20.6	3.7	4.5	1.2	4.97
200,000-1,000,000	10.1	9.3	8.1	7.7	64.8	34.5	27.1	4.3	5.5	1.4	6.16
50,-200,000	9.5	8.8	8.1	7.5	66.1	42.6	25.0	4.4	5.7	1.5	6.56
20,-50,000	9.1	8.9	8.3	7.8	65.9	46.0	23.1	4.2	5.1	1.3	5.55
10,-20,000	9.7	9.0	8.3	7.7	65.3	52.1	19.6	4.1	5.0	1.2	5.05
5,-10,000	9.8	9.4	8.5	7.9	64.4	51.9	20.7	4.3	5.3	1.2	5.06
2,500-5,000	9.0	9.0	8.7	7.6	65.7	56.9	18.1	3.5	4.0	1.1	4.42
Under 2,500 Inc.	9.2	9.3	9.0	7.6	64.9	66.1	14.5	2.9	3.2	1.0	4.12
Unincorporated towns												3.93

variations held true for New York State for these diseases and also for measles, whooping cough and poliomyelitis, and whether these variations showed any constancy as the size of the community varied. Accordingly, the communities of the state were classified into 8 groups for the quinquennium 1915-1919 according to their estimated population as of July 1, 1917. The estimates for each group for each year were based on the United States census of 1910 and the state census of 1915. For the quinquennium, 1920-1924, the communities were grouped according to the estimated population of 1920 based on the state census of 1915 and the federal census of 1920.

Each of the groups is held constant for the quinquennium except as a village or city may be incorporated from previously unincorporated territory. In this event the population of the city or village is added to that of the group to which it belongs according to the enumerated or estimated population at the time of incorporation as shown by the return made to the secretary of state, and the same figure is subtracted from the population of the town group. We have preferred to keep the

groups thus constant throughout the quinquennium rather than shift the individual communities about from year to year as their estimated populations might rise above or fall below the limits of the group to which they were originally assigned. The principal reason for this was to avoid accidental fluctuations in rates due to epidemics. The division points are arbitrary in any event and there is no essential difference between a place of 2,400 and one of 2,600 or one of 9,000 and one of 11,000.

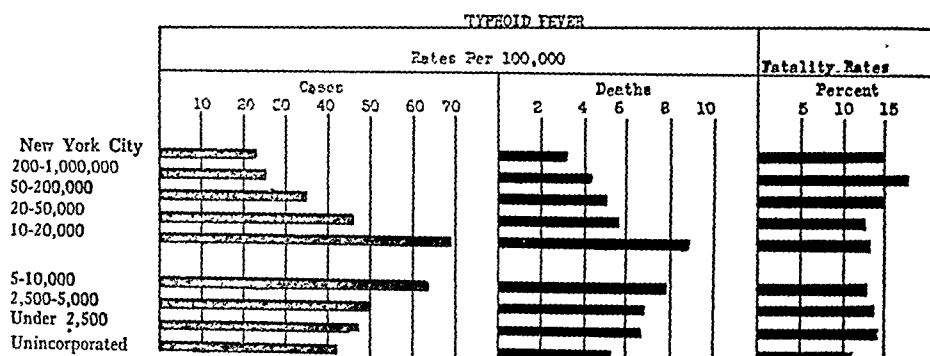
On the other hand the cyclical return of measles, for example, might strike a community the year of its transfer, or the year before its transfer to another group. In the former case there would be a purely artificial increase in the rate of the group to which the community was transferred while in the latter there would probably be factitious decrease because of the addition of a population with little likelihood of another outbreak for a number of years. Although it may be that the groups are too numerous, in that the populations of certain of them are too small and that essential differences between successive groups are not easily discernible, yet two or more groups may easily be combined by any one wishing a broader classification, as we do ourselves in common practice.

We have estimated also the populations for each 5-year age period under 20 and for the period 20 and over, for each of the population groups, and have calculated sundry items such as the percentage of foreign born women age 20 to 24, the number of families per dwelling, persons per dwelling and the percentage of illiterates. Unfortunately the federal census furnishes no figures which enable one to distinguish between incorporated places of less than 2,500 and unincorporated territory. There are other deficiencies in the figures on the characteristics of the population of places of less than 10,000 but this deficiency in the statistics of places of less than 2,500 population I regard as the most unfortunate. As will be seen from the subsequent tables there is a striking difference in the morbidity and mortality figures between incorporated places of less than 2,500 and the unincorporated towns. To what extent they are due to differences in the population makeup, we have no means of telling.

TYPHOID FEVER

The first of our tables to be considered is for typhoid fever, representing 33,597 cases and 4,653 deaths. The 10-year average of the case, death and fatality rates by each of the population groups is shown in Figure I. Both cases and deaths have been allocated to the place where infection occurred so far as this could be determined with reason-

FIGURE I



Case, death and fatality rates for typhoid fever according to size of community (density of population)

Average for New York State 1915-1924

able certainty. This shows quite distinctly that typhoid fever is neither a rural, nor a large city, nor yet a small village disease in New York. The highest case and death rates are in the cities of from 10,000 to 20,000. Both morbidity and mortality regularly increase through the successive groups to this group and then decline. The inferences we draw from the table are that rural conditions in New York are not very favorable to the transmission of typhoid fever; that flies play a minor rôle, that the infection of private wells is not very common; and that contact cannot be a major factor else the rate would continue to increase as dispersion decreased.

The high rates in places of from 5,000 to 20,000 indicate inadequate safeguards over the water and milk supplies. A well that may supply without mishap a community of 5,000, begins to drain pollution when twice as much water is pumped from it or an auxiliary supply of doubtful purity is resorted to from time to time as the regular supply fails. The need for a better quality of supervision than suffices for the small village is not recognized. This failing is even more likely to be true of the milk supply. The personnel of the health department is not expanded to keep pace with the increasing number of dairies, and pasteurization of the milk supply encounters greater difficulties than in larger places.

Personally, I believe that a very large part of this small city typhoid is transmitted through milk and water and remains unrecognized as such because the cases occur sporadically or in very small outbreaks, the primary epidemiological data are not collected with sufficient thoroughness, and the histories of cases of prior years are not reviewed with those of the current cases.

TABLE III
PERCENTAGE OF TOTAL CASES AND DEATHS AND FATALITY RATE AT EACH AGE PERIOD
ALL PLACES UNDER 200,000 POPULATION, 1915-1924

Age	Per cent of all ages		Fatality Rate Per cent
	Cases	Deaths	
- Under 5 years	4.5	3.1	8.4
5-9	13.8	5.0	4.4
10-14	14.3	7.5	6.4
15-19	14.2	11.8	10.2
20-24	12.0	12.2	12.5
25-29	9.7	10.7	13.5
30-34	7.7	10.3	16.4
35-39	6.3	7.9	15.2
40-44	5.4	6.6	15.2
45-49	3.9	6.3	19.9
50-54	3.3	6.1	22.9
55-59	2.0	3.7	22.8
60 and over	2.9	8.7	36.5

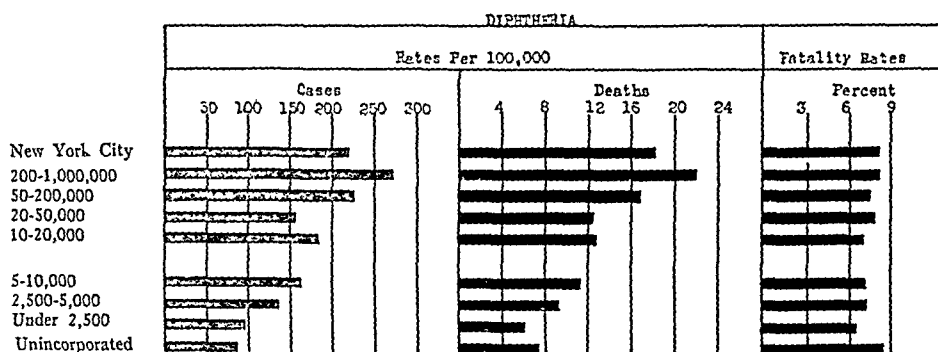
Despite the low rates in the unincorporated towns and the small villages, it is a common custom of the larger places to charge their summer and autumnal typhoid increase to vacations in the rural districts. Failure to study local cases honestly has led to at least one disastrous outbreak in recent years.

The average distribution of cases and deaths and the fatality rates by age of typhoid are shown in Table III, representing 16,607 cases and 2,034 deaths. The largest number of cases was in the age period 10 to 14 years with the period 15 to 19 years almost as large. Of all the cases, 28.5 per cent fall in the period covering the second decade of life. The largest number of deaths occur from 20 to 24 years, the 15- to 19-year period again being a close second. There is little difference in the proportion of cases by ages between the smaller and larger communities except that a much larger percentage of the cases and deaths occur at 60 and over in the places under 10,000, than in places of greater size. The lowest fatality rate is at age 5 to 9, when it is about one-third of the rate at all ages. The fatality rate at all ages over 45 is very high, but only a little over 12 per cent of the cases occur after that age.

DIPHTHERIA

The case, death and fatality rates for diphtheria by size of place are shown in Figure II, representing 200,111 cases and 16,030 deaths. It will be observed that there is a fairly uniform decline in both the case and death rates as we go from the largest cities to the smallest villages and that although the morbidity rate is less in the towns than else-

FIGURE II



Case, death and fatality rates for diphtheria according to size of community (density of population)
Average for New York State 1915-1924

where, the mortality is higher than in the small village group. The fatality rate is highest in the towns, next highest in the largest cities, and is lowest in the small villages.

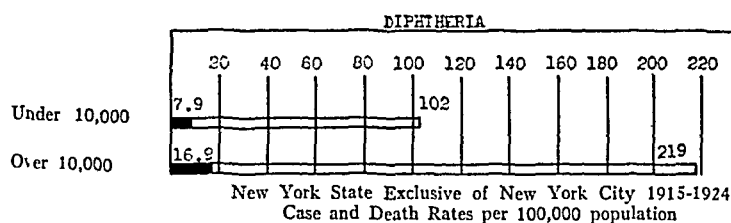
Two exceptions to these general statements are to be noted: First, the case and death rates for New York City are smaller than the corresponding rates for places from 200,000 to 1,000,000; and, second, the rates for places of 20,000 to 50,000 are smaller than the rates for those of 10,000 to 20,000. As to the first, an examination of the annual figures show that for the first 5 years of the decennium, the rates were almost identical and that the New York City rate fell very rapidly after 1919.

The rate in the group of 200,000 to 1,000,000 also began a very rapid decline after 1920 but this was largely a recession from a period of very high rates due to an extensive and very fatal outbreak in Buffalo. The New York City decline therefore seems more significant of improvement in control. In 1921 the rate for that city was lower than for the rest of the state for the first and only time in its history, following two years of extensive toxin-antitoxin work that had been done in the public schools by the late Dr. Zingher. It seems possible that although this school immunization did not reach the heart of the problem, it made possible an unprecedented reduction from the rates of former years.

We are unable to account for the unusually low rate in places of 20,000 to 50,000. This same discrepancy appears also in the case rates from scarlet fever and the death rates from scarlet fever and measles. We have sought rather diligently for a plausible reason, but apparently it is not to be found in the population makeup, nor can it be

accounted for by notable work in immunization, since much the same irregularity existed for the 5-year period 1915-1919 before any large scale toxin-antitoxin work was begun. The outstanding fact, as shown by these figures, is that diphtheria is a disease of cities both in prevalence and mortality—a fact more clearly shown when we compare the case and death rates of places over, and places under 10,000 (Figure III).

FIGURE III



The lower case rate and the higher death rate in the unincorporated territory has been noted. This is a feature which is also common to scarlet fever, measles and whooping cough, but not as we have already seen to typhoid fever, nor as we shall see later to poliomyelitis. We have interpreted this as being due partly to poor reporting in the unincorporated districts and partly to less adequate medical and nursing care. We have not attempted to assess the relative weights of these two factors as it is obviously difficult to obtain the data necessary to form a judgment. It is not unreasonable to believe, however, that considering the distances to be covered, the greater expense and the difficulties of winter travel in New York State, the administration of antitoxin is frequently delayed in rural districts either because the physician is not called until the case is regarded as serious or because an extra trip has to be made if the physician is not given a hint as to the possibility of diphtheria before making his first visit. The likelihood of death from respiratory obstruction before medical aid can reach the patient is also increased.

The age distribution of diphtheria cases and deaths and the fatality rates by age are shown in Table IV, representing 50,256 cases and 3,715 deaths. It will be seen that a little less than a quarter of all the cases and a little more than half of the deaths occur in the first 5 years of life; that a little more than a third of the cases and rather less than a third of the deaths occur in the age period 5 to 9. The table shows that 57 per cent of the cases and 82 per cent of the deaths occur in children under 10 years of age. The importance of this in planning a toxin-antitoxin campaign is quite apparent. Where the resources are limited and the difficulties at best are very great, it is extremely important

TABLE IV

PER CENT OF TOTAL CASES AND DEATHS AND FATALITY RATE AT EACH AGE,
ALL PLACES UNDER 200,000 POPULATION, 1915-24

Diphtheria

Age	Per cent of all ages		Fatality Rate Per cent
	Cases	Deaths	
Under 1 year	1.3	4.7	26.9
1	2.8	10.6	28.1
2	4.8	12.2	18.6
3	6.4	12.2	14.1
4	6.8	11.8	12.8
5	7.4	9.9	9.9
6	8.1	7.7	7.0
7	7.5	5.8	5.7
8	6.5	4.1	4.6
9	5.3	3.4	4.8
Under 5 years	22.2	51.5	17.2
5-9	34.8	30.9	6.6
10-14	17.8	8.2	3.4
15-19	7.0	2.4	2.5
20 and over	18.3	6.9	2.9

that the efforts be expended where they will produce the greatest corresponding benefit. The failure to reach the preschool age group means that less than half of the mortality can be prevented at the most, and that campaigns limited to school children will not suffice to reduce the death rate permanently to a very marked degree.

In Table V are shown the percentages of cases and deaths under 5 years of age according to the size of the community. This is interesting in that it shows the much higher proportion both of cases and deaths at this age in the large communities as compared with the small ones, a feature common to this class of diseases. It will be noted that in the group of 20,000 to 50,000 population the percentage of deaths is very much smaller than in the three succeeding groups. A somewhat surpris-

TABLE V

PER CENT OF TOTAL CASES AND DEATHS AND FATALITY RATE UNDER 5 YEARS OF AGE,
ALL PLACES UNDER 200,000 POPULATION, 1915-1924

Diphtheria

Population Group	Rates per 100,000		Fatality Rate Per cent
	Cases	Deaths	
Total	22.2	51.5	17.2
50-200,000	28.4	59.6	14.7
20-50,000	21.5	46.9	16.0
10-20,000	23.2	56.0	16.8
5-10,000	21.4	59.9	19.8
2,500-5,000	19.8	50.5	18.1
Under 2,500	13.9	37.0	16.7
Unincorporated	19.1	46.2	20.5

ing figure is the large percentage of cases and deaths under 5 years of age in the unincorporated territory, much larger it will be noted than in the group of smallest villages. The fatality rates at this age are shown in column 3 and call attention to the very high rate which still prevails despite the almost universal use of antitoxin.

Since it is quite obvious that the age distribution of the population may be responsible for certain of the variations in the incidence at different age periods, Table VI shows the specific case and death rates

TABLE VI

AVERAGE CASE AND DEATH RATES PER 100,000 POPULATION AT EACH AGE PERIOD 1915-24

Diphtheria

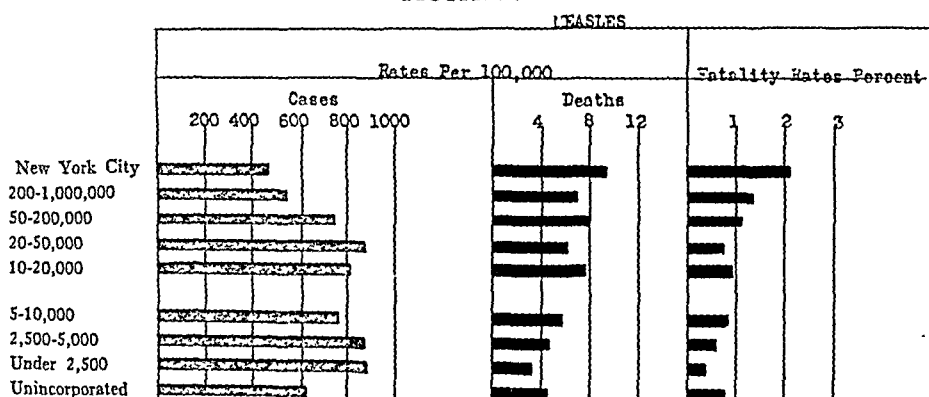
Population Group	Under 5		5-9		10-14		15-19		20 & over	
	C	D	C	D	C	D	C	D	C	D
50,-200,000	522	77	738	38	324	10.3	112	2.0	36.8	0.8
20,-50,000	266	46	512	37	275	8.2	105	2.7	28.4	0.8
10,-20,000	425	71	716	43	386	7.0	142	2.3	43.9	1.0
5,-10,000	349	69	608	29	355	11.4	139	3.8	42.1	0.8
2,500-5,000	300	54	514	37	296	6.7	140	3.6	41.6	0.9
All others	176	35	300	24	187	8.5	105	3.1	31.8	1.2

by 5-year age groups under 20 years. It is unfortunate that we are unable to give separate rates for the small villages and the unincorporated territory as it may be that there are important differences. It will be noted that the recession in case and death rates in the cities of 20,000 to 50,000 previously mentioned holds in the specific as well as in the crude rates. It will be seen too that the decline in the case and death rates from those of large places to those of small is most marked in the lower age periods.

MEASLES

The distribution of measles cases and deaths and the fatality rates by size of the community are shown in Figure IV, representing 594,159 cases and 8,176 deaths. For places other than New York City the deaths occurring in institutions for children have been excluded. The high fatality rates which formerly at least prevailed in these institutions produced an undesirable distortion of the mortality and fatality rates; in other words, the fatality and mortality rate of a group would depend in a considerable degree upon whether or not there were located in the communities constituting that group a number of institutions caring for small children. The unequal distribution of such institution deaths is shown by the fact that in the places of 200,000 to 1,000,000, only 5 of the 557 deaths in the 10-year period were in such institutions, whereas in places of 50,000 to 200,000, 85 out of 654 deaths occurred

FIGURE IV



Case, death and fatality rates for measles according to size of community (density of population)
Average for New York State 1915-1924

in such institutions. In the one case the mortality rate per 100,000 population was raised by only 0.1 and in the latter by 1.2.

The noticeable feature of the case rate is that measles was apparently equally as prevalent in the smallest villages as in the cities, although the mortality rate shows much the same tendency to decline that we found in diphtheria.

Attention is called to the extremely low fatality rate for the small villages where out of 31,214 cases there were but 120 deaths in the 10-year period.

The per cent of cases and deaths and the fatality rates by age are shown in Table VII, representing 268,250 cases and 1,940 deaths. It will be observed that although only 13.2 per cent of the cases occurred in children under 3 years of age, that 66.4 per cent of all of the deaths occurred at those ages. Seventy-five and one-half per cent of the deaths occurred under 5 years of age, and although nearly 50 per cent of the cases occurred from the 5th to the 14th year these age periods were responsible for only 12 per cent of the deaths. The highest fatality rate was in children under 1 year of age but the greatest number of deaths occurred at age 1 year. The fatality rate drops very rapidly during the first few years of life and the disease is apparently least fatal between the 5th and the 15th year.

There is some question, of course, as to the relative completeness of reporting at the different ages, as it might be that a child of school age would have a better chance of being reported than the preschool child or the adult. We have endeavored to answer this question from the data secured during the intensive investigations of a few community epidemics, and find that although in an epidemic in a small village the

TABLE VII
PER CENT OF TOTAL CASES AND DEATHS AND FATALITY RATE AT EACH AGE, ALL PLACES
UNDER 200,000 POPULATION, 1915-1924

<i>Measles</i> Per cent of all ages			Fatality Rate Per cent
Age	Cases	Deaths	
Under 1 year	2.2	24.6	7.93
1	4.8	30.8	4.63
2	6.2	11.0	1.29
3	7.0	5.7	0.59
4	7.7	3.4	0.32
5	9.1	2.5	0.20
6	11.1	2.3	0.15
7	10.0	1.9	0.14
8	8.1	1.2	0.11
9	5.6	1.3	0.16
Under 5 years	27.9	75.5	1.96
5-9	43.9	9.2	0.15
10-14	14.8	2.8	0.14
15-19	6.2	2.6	0.30
20 and over	7.2	9.9	1.00

reporting was actually better in children under 5, the reverse has been true in each of the larger places. In a city of 20,000 the ratio of completeness of reporting was about 9 to 10 and in two cities of over 100,000 the ratio was about $7\frac{1}{2}$ to 10. These investigations have also shown that the ratio of reporting was much less complete in the larger places than in the smaller ones, accounting in part for the relatively lower case rates and higher fatality rates in the former.

TABLE VIII
AVERAGE CASE AND DEATH RATES PER 100,000 POPULATION AT EACH AGE PERIOD 1915-24
Measles

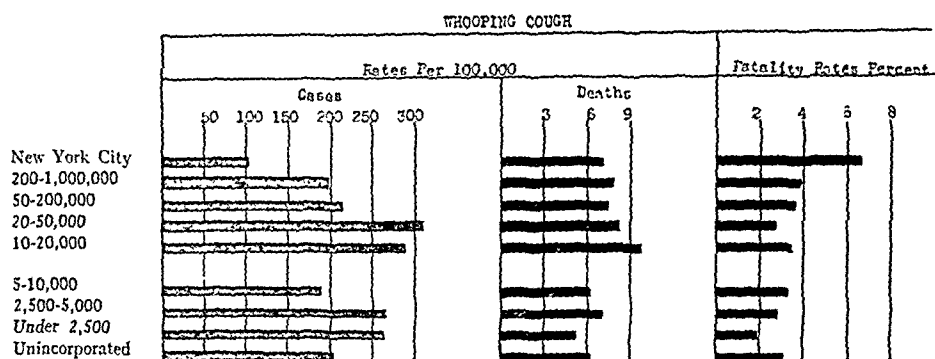
Population Group	Under 5		5-9		10-14		15-19		20 & over	
	C	D	C	D	C	D	C	D	C	D
50,-200,000	2087	52	3055	3.4	389	0.7	143	0.0	28.4	0.1
20,-50,000	2304	37	3587	3.3	679	0.5	187	0.7	35.5	0.4
10,-20,000	2800	59	4254	6.3	720	0.9	261	0.3	49.2	0.4
5,-10,000	2267	45	4060	11.3	920	2.0	306	0.5	55.3	0.3
2,500-5,000	2742	41	4710	8.5	1303	0.8	455	1.6	69.2	0.5
All others	1551	29	2615	4.1	1507	2.3	887	2.9	110.0	1.2

Table VIII shows the specific rates by age. The high mortality in children under 5 years old and the comparatively low death rate at this age in places of from 20,000 to 50,000 are noteworthy. The low case and death rates under 5 years and the higher case and death rates in the age groups over 10 in places of less than 2,500 indicate cause and effect in herd susceptibility.

WHOOPIING COUGH

Figure V shows the distribution of whooping cough cases and deaths and the fatality rates by size of the community, representing 168,315 cases and 7,353 deaths. It will be noted that although the case rate is

FIGURE V



Case, death and fatality rates for whooping cough according to size of community (density of population)
Average for New York State 1915-1924

more than twice as high in the state outside of New York City as in the city itself, the death rates are practically identical. Less complete reporting undoubtedly accounts for the bulk of this discrepancy.

There seems to be no regular relationship between either the morbidity or mortality rates and the size of the community. I would point out, however, that although whooping cough is frequently spoken of as a rural disease and the death rates for the registration area show a higher mortality in the urban than in the rural districts, in New York State the highest morbidity and highest mortality are found in the two groups comprised of places having populations of from 10,000 to 50,000. The fatality rates are highest in the larger cities, lowest in

TABLE IX

PER CENT OF TOTAL CASES AND DEATHS AND FATALITY RATE AT EACH AGE, ALL PLACES
UNDER 200,000 POPULATION, 1915-1924

Whooping Cough			
Per cent of all ages			Fatality Rate
Age	Cases	Deaths	Percent
Under 1 year	7.9	56.9	20.07
1	8.1	23.1	7.96
2	9.7	7.9	2.29
3	10.6	3.6	0.95
4	10.5	2.5	0.66
5	11.0	1.4	0.36
6	10.9	1.0	0.26
7	8.7	0.9	0.28
8	6.5	0.5	0.23
9	4.1	0.2	0.14
Under 5 years	46.8	94.1	5.62
5-9	41.2	4.0	0.27
10-14	8.5	0.6	0.20
15-19	1.4	0.3	0.58
20 and over	2.1	1.0	1.33

the small villages and apparently depend for the most part on the relative completeness of reporting.

The age distribution of the cases and deaths and the fatality rates by age are shown in Table IX and serves to emphasize the large proportion of deaths which occur in the early years of life, especially during the first year of life. Nearly 95 per cent of all the deaths occur at this time. It also shows that unlike measles the greatest morbidity is during this age period.

TABLE X

AVERAGE CASE AND DEATH RATES PER 100,000 POPULATION AT EACH AGE PERIOD, 1915-24
Whooping Cough

Population Group	Under 5		5-9		10-14		15-19		20 & over	
	C	D	C	D	C	D	C	D	C	D
50-200,000	945	51	777	1.4	90	0.2	10	0.0	4.6	0.04
20,-50,000	1298	51	1075	2.2	123	0.0	15	0.0	5.1	0.00
10,-20,000	1543	90	1190	3.1	132	0.3	21	0.0	6.3	0.04
5,-10,000	948	59	862	4.1	121	0.0	17	0.0	3.3	0.13
2,500-5,000	1448	72	1277	2.7	179	1.6	28	0.0	7.7	0.11
All others	964	61	952	3.0	310	0.5	65	0.5	8.6	0.14

The specific case and death rates by age are given in Table X. With the exception of two groups the death rate under 5 is higher than for any other of the so-called children's diseases and the death rates at this age are higher in each of the groups under 10,000 population than in either of the two groups of over 20,000. This is a remarkable thing in a disease of the respiratory tract presumably transmitted by immediate contact. It is important because it seems to support the hypothesis that poliomyelitis is ordinarily transmitted in much the same way.

Whooping cough ranks next to diphtheria in New York as a cause of death from the acute communicable diseases of childhood and its death rate has declined less than that of any of the others during the past twenty years. It is the least completely reported and is perhaps the most difficult to control of our epidemic diseases.

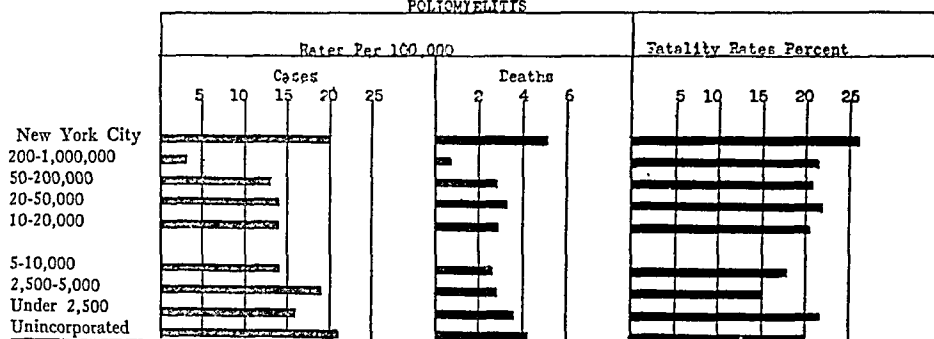
POLIOMYELITIS

The case and death rates and the fatality rates for poliomyelitis by size of community are shown in Figure VI, representing 18,299 cases and 4,337 deaths. The relatively high case and death rates in New York City are due entirely to the great epidemic of 1916. Since then the highest case rate in New York City has been 10 per 100,000 and the highest death rate 2.5 per 100,000. Most of the other groups shared in the high rates of 1916 but the places of 200,000 to 1,000,000 were an exception. It is a curious fact that the city of Rochester has never suffered a large epidemic of poliomyelitis.

The remarkable feature in the distribution of poliomyelitis by size

FIGURE VI

POLIOMYELITIS



Case, death and fatality rates for poliomyelitis according to size of community (density of population)
Average for New York State 1915-1924

of community is the high case and death rate which prevailed in places of less than 5,000 population. I wish to point out also that the case rate, as well as the death rate, was higher in the unincorporated towns than in the groups of denser population, and the fatality rate was lower than in the villages of less than 2,500. It seems to me that this distribution is very difficult to explain on the hypothesis that poliomyelitis is spread for the most part by contact and through the secretions of the nose and throat. None of the other diseases supposed to be so transmitted shows a higher crude case rate in places where the dispersion of population is greatest and the mortality and fatality rates seem to confute the argument that it is due to vagaries of reporting.

TABLE XI

PERCENTAGE OF TOTAL CASES AND DEATHS AND FATALITY RATE AT EACH AGE, ALL PLACES
UNDER 200,000 POPULATION, 1920-1924

Age	Poliomyelitis		Fatality Rate
	Per cent of all ages		
	Cases	Deaths	Per cent
Under 1 year	4.3	6.8	26.1
1	10.1	10.8	17.4
2	10.8	6.5	9.8
3	9.0	5.7	10.3
4	8.3	6.8	13.4
5	5.8	4.5	12.8
6	6.2	4.0	10.4
7	4.8	5.1	17.3
8	3.8	3.4	14.5
9	3.6	2.6	11.7
Under 5 years	42.5	36.6	14.0
5-9	24.2	19.6	13.2
10-14	15.0	17.3	18.9
15-19	8.7	7.7	14.4
20 and over	9.6	18.8	31.7

The distribution of cases by age, shown in Table XI, shows that less than half of the cases and deaths occurred in children under 5. It also shows that nearly 10 per cent of the cases and almost 20 per cent of the deaths occur in adults. The percentage of cases for each age group by size of community shows the usual greater incidence among the young in the larger places and the relatively large distribution among adults in the small villages and unincorporated towns. The number of cases comprised in some of the groups as shown is quite small, however, and one's interpretation must be cautious.

TABLE XII
AVERAGE RATES PER 100,000 POPULATION AT EACH AGE, 1920-24
(BASED ON 1922 POPULATION ESTIMATES)

Population Group	<i>Poliomyelitis</i>									
	Under 5		5-9		10-14		15-19		20 & over	
	C	D	C	D	C	D	C	D	C	D
50,-200,000	63	5.2	27	3.0	12	3.5	7	2.8	1.0	0.3
20,-50,000	54	9.2	22	2.1	10	2.7	8	1.9	1.3	0.3
10,-20,000	44	7.4	26	4.3	18	2.9	14	1.2	1.5	0.6
5,-10,000	32	4.8	14	4.0	10	2.2	5	0.0	0.6	0.0
2,500-5,000	46	6.7	25	2.3	15	3.1	10	0.9	0.9	0.1
All others	43	6.8	32	4.4	23	3.8	16	1.7	2.1	0.7

Table XII shows the specific case and death rates by 5-year age groups. The comparatively high case and death rates in places over 10,000 as compared with smaller places of ages under 5 is in contrast with the crude case and death rates. The comparatively low case and death rates at all ages in places of 2,500 to 10,000 and the high case and death rates, especially the former, in places under 2,500, are perhaps worthy of remark.

In the foregoing I have selected certain features shown by the tables and touched briefly upon my interpretation of them. But whether the selection is good or the interpretation is correct is of less importance than bringing these tables and the more extended ones upon which they are based* to the notice of others better able to deal with them from a technical standpoint. We know that they have an immediate value in administrative practice and they have suggested hypotheses we hope to test by further investigations. I feel quite sure that there are implications which have altogether escaped me but which will be discovered by other more discerning workers. It is not too much to hope, I trust, that good use will be made of these figures, that other lines of investigation will be suggested, that our knowledge of communicable diseases will be to some extent deepened and administrative procedure placed on a sounder basis.

* *Annual Report*, New York State Dept. of Health, Vol. 1, pp. 130, 1925.

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THE PREVALENCE OF THE VENEREAL DISEASES

HOW much syphilis and gonorrhea is there in the United States? Accurate data on the prevalence of the venereal diseases are lacking. Old figures are still being quoted, such as those obtained from the draft examination, special group reports, such as army, navy or hospital figures, and case reports made to state health departments and collected by the U. S. Public Health Service. It has been impracticable so far to obtain accurate information for a general population group. Such information is essential to an intelligent understanding of the many problems connected with the control of the venereal diseases. Therefore, an effort has recently been initiated to take soundings in various parts of the country—that is, to select cities typical of various conditions and make every possible effort to obtain a count of “known” cases of syphilis and gonococcal infection.

To answer, then, the question, “How much syphilis and gonorrhea is there in the United States?” incidence studies have been made by the American Social Hygiene Association in coöperation with the U. S. Public Health Service in a number of places including Detroit, Atlanta, Cleveland, New Haven and other cities and counties. The desired information was secured through personal interviews of doctors and other persons “licensed to practice the healing art.” Each one was asked how many cases he had under treatment or observation on a given date. The accuracy and completeness of the data was entirely dependent upon the physicians’ good faith and willingness to coöperate in the undertaking. Interest was shown to a surprising degree, and there has been a general request for final tabulated results. In Detroit only 8 out of 1747 practitioners refused information.

Of the 1,739 physicians who did reply in the Detroit study 49 per cent reported one or more cases of venereal diseases. Of the 66 clinics and hospitals reporting, 35 per cent had cases under treatment. In

all, 16,735 cases of syphilis and gonorrhea were said to be under observation or treatment on the day selected, a rate of 13.47 cases per 1,000 total population of the city. Males over 16 years of age showed a rate of 24.29 per 1,000 of the corresponding group of the population. Of the total cases reported, 8,665 were syphilis, a rate of 6.98 cases per 1,000 population, and 8,070 were gonorrhea, or 6.50 per 1,000. Of the total number enumerated, syphilis cases were slightly more numerous than gonorrhea cases, but in the male group 16 years and over, gonorrhea cases slightly predominated. Seventy per cent of the total number were being treated in private practice. About 96 per cent of the total number of cases were among persons 16 years of age or over, but among males about 97 per cent of the cases and among females 91 per cent were of this age group. Relatively more cases seem to occur at the younger ages among females. Of the total number of syphilis cases, 37 per cent were females, and of the total gonorrhea cases 22 per cent. But among persons under 16 years of age 52 per cent of syphilis cases and 72 per cent of the gonorrhea cases were among females. It appears that both of these diseases are relatively more frequent among young females than among young males.

The question arises as to what is the relation of the number of cases under treatment or observation on one day to the total number seen in a year. Accordingly many doctors were questioned as to the annual turnover of patients in their offices. Estimates varied between 5 and 20. Many patients "shop around" between different doctors and clinics during the course of a year so that if a year's cases were counted there would be considerable duplication of individuals. The clinic probably makes a greater effort than the private physician to keep its patients continually coming for treatment until cured. So taking everything into consideration, it might be assumed that the patients enumerated in the one day census were about one-fifth of the total number seen in a year.

The information collected by the Detroit survey and other similar studies cannot possibly give an accurate measure of the actual prevalence of venereal diseases. Even if cases known to medical practitioners can be counted accurately, there is no way, from the information now available, in which the number of cases can be estimated which are not under treatment, either on account of ignorance or indifference of those affected, or because they are undergoing self-treatment. The count in the Detroit survey, however, revealed an unexpected number of cases actually under treatment. How many more there must be it is impossible to say. The army figures showed a ratio of one syphilis case to every four of gonorrhea. The Detroit study showed gonococcal

infections, among males over 16 years of age at least, only slightly outnumbering syphilis cases. Does this mean that there is less gonorrhea among adult men than was found at the time of the army draft examination ten years ago, or is self-treatment or no treatment at all a common state of affairs, so that a large number of existing cases were not counted in the Detroit study? These and other questions of a similar nature are important to the public health administrator today.

Another important fact brought out by the survey was that 70 per cent of all the cases enumerated were under treatment by private practitioners. About half the physicians visited had cases under treatment. Thus it would seem that the physician, rather than the public clinic, very largely holds in his hands the problem of the control, and therefore the prevention, of the venereal diseases.

These studies will be continued, and it is hoped that by the end of 1928 enough data will be in hand to provide a base line from which to measure future trends in venereal disease incidence.

NOTE Copies of the report *A Survey of the Venereal Disease Prevalence in Detroit*, can be had upon application to the American Social Hygiene Association, 370 Seventh Avenue, New York, N. Y.

THE FOOD VALUE OF MILK

WE believe that there is no question in the minds of American physicians concerning the necessity of milk as a food, especially for growing children, though its value for adults is also recognized. The general knowledge of the food value of milk was recognized long before the discovery of vitamins. This discovery, however, added exactness to our observations and strength to the argument in favor of milk.

Recent publications of a preliminary report^{1,2} made under the auspices of the Scottish Board of Health have confirmed the previously held ideas and carried them somewhat further. Groups of children of the ages of 5 to 6, 8 to 9, and 13 to 14 years in seven Scottish towns were selected, four groups for each town, each of which contained from 40 to 50 children. The first group was given the ordinary diet; for the second the diet was supplemented by biscuit, the third by separated milk, and the fourth by whole milk. The feeding was carefully supervised at the schools, in addition to which, the home dietary in 626 cases was studied, since some children received milk there in addition to that given at the schools, and the latter was regarded as an accessory article of diet. The experiment continued over seven months, and showed an average monthly increase of 0.17 inches and 0.42 pounds for the groups which did not receive extra milk, against 0.21 inches and 0.52 pounds for those receiving milk. The average increase in height was 1.470 inches, and in weight 3.617 pounds, for the milk-taking

group, against 1.212 inches and 2.974 pounds for those not receiving it. These figures include the three age groups mentioned. For the age group 5 to 6, the percentage of increase in height of those taking over the average amount of milk was 9.4, for the age group 8 to 9, 15.5, and for the 13 to 14 group, 24.2.

The general condition of the children was noted, and on the whole it was found that the hair was glossier, the complexion clearer, and they held themselves more erect. There were some exceptions to this general rule, and the most marked improvement occurred in those groups in which the condition of the children was poorer to begin with. The general condition, however, has led Dr. Orr, who is Chairman of the Research Committee, to draw conclusions which he calls provisional, though there is little doubt that further experiments which are under way will confirm them. These may be summed up as follows:

The children who received an addition of milk to their diet showed a rate of growth as indicated in both height and weight, 20 per cent greater than those not receiving the extra milk, accompanied by an improvement in their general condition. Of particular interest are the groups which were fed on separated milk, which has been discredited in this country as well as in England to a great extent. Dr. Orr concludes that it is of great value for promoting growth and that its nutritive value seems to have been much underestimated. The *British Medical Journal* makes the interesting comment, in comparing the children fed on biscuit with those taking extra milk, that the aggressive and dominant races have usually been those which consumed milk, while the docile and subject ones have used grain as their principal diet.

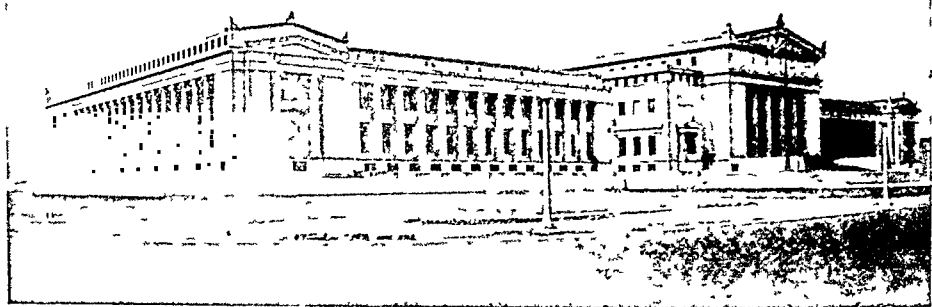
While accepting these conclusions, concerning the accuracy of which we have no doubt, we wish to point out that there is no food of equal value which is generally so badly handled as milk, or which has been subject to so great manipulation. In most countries, especially the United States and England, there are numerous regulations concerning the quality and handling of milk and milk products, and one need only consult the records to see how often these regulations are violated.

Milk varies with the season and with the feeding of the cow, especially in regard to its vitamin content. Campaigns to increase the drinking of milk and the use of butter are excellent in their way, but the public deserves to have the information that there is a great difference between the milk derived from pasture-fed cattle and that obtained in winter from stall-fed animals, unless particular attention is paid to their diet, and that dirty milk is a menace rather than a blessing.

REFERENCES

1. *Brit. M. J.*, Jan. 28, 1928, p. 140.
2. *Lancet*, Jan. 28, 1928, p. 202.

ASSOCIATION NEWS



*The New Field Museum of Natural History
Roosevelt Road in Grant Park*

57TH ANNUAL MEETING OF THE A.P.H.A.

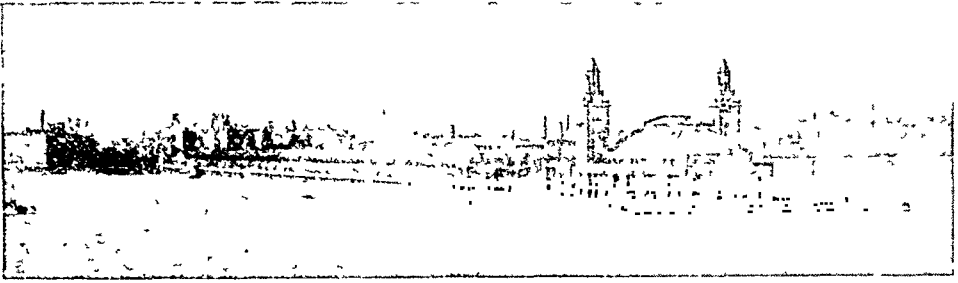
CHICAGO and the Middle West are eagerly looking forward to the 57th Annual Meeting to be held at Hotel Stevens, October 15-19. The Local Committee has been organized under the chairmanship of Dr. Louis E. Schmidt, and plans are being made in coöperation with the Association officers for the largest meeting we have ever had.

The last Annual Meeting in Chicago was held in 1918. While a successful one in many ways, it was held under disadvantages as the man power and energies of the nation were then directed toward one thing—success in war. Chicago has made wonderful strides in the last decade, not only in public health achievements but also in civic developments. The delegate to the 1918 meeting who has not been in that city since will experience a most agreeable surprise when he returns to Chicago this fall. He will find an entirely new skyline always in a state of change; a new and growing lake front park system, made by filling in Lake Michigan, beautified by magnificent buildings and

monuments; spacious single and double-decked boulevards for the building of which whole city blocks were wrecked; improved railway terminal facilities, and an atmosphere of enthusiasm locally, which is equally as contagious as it is invigorating.

Chicago has truly won the unique distinction of being the Convention City of America. It has an abundance of the things which go to make a success of a meeting such as the American Public Health Association sponsors—where the delegates come to spend a week in seriously applying themselves to professional matters relating to public health, but where they are afforded relaxation in profitable entertainment. To this end the Chicago Local Committee is formulating its policies and directing its efforts.

The selection of Hotel Stevens as headquarters assures the best in the way of convention service. This hotel is the largest in the world, having over 3,000 guest rooms. It can not only accommodate all delegates and guests, but house



Municipal Pier

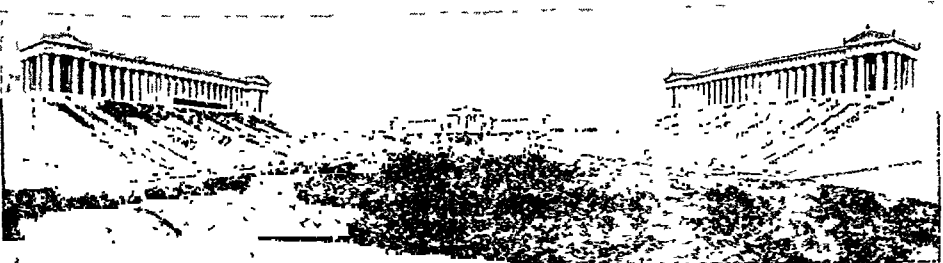
all convention activities under the one roof—meetings, exhibits, and entertainment features.

The Stevens is Chicago's newest hotel and is splendidly located with reference to railroad terminals and local transportation facilities. It is on Michigan Boulevard, famous the world over for its fashionable shops and brisk lake breezes, and overlooks Grant Park and Lake Michigan. This park holds the keystone position in Chicago's lake front park system and is being developed as one of the most elaborate and magnificent civic centers in the world. From his room in Hotel Stevens, one may look across the park and see the beautiful Buckingham Memorial Fountain with its gorgeous display of graceful water sprays. This fountain in display at night is a real inspiration. To the south stands the famous Marshall Field Museum of Natural History, one of the finest specimens of Grecian architecture on the continent, and costing over \$7,500,000. Within this museum are acres of exhibit rooms where are shown thousands of

priceless collections and rare specimens. Its collections of anthropological, botanical, geological and zoological exhibits rate with the world's best. Here may be seen some of the finest taxidermy and the finest collection of jewels in America. The visitor could spend weeks in this museum and still have much to see and learn. The directors of this institution have dispatched scores of scientific expeditions to all parts of the world collecting specimens, making new discoveries and seeking additional facts in many fields of natural history.

Soldiers' Field with its huge stadium is situated just south of the museum and harmonizes with it in architectural features. Here were held the famous Army-Navy football game of 1926, the great Tunney-Dempsey fight and the World's Eucharistic Congress of 1927. The stadium has seated as many as 150,000 people.

Beyond the park and extending eastward to the skyline at the horizon lies Lake Michigan. Projecting out of the water like tiny islands and sometimes



Soldiers' Field

mistaken for vessels may be seen the circular crib structures protecting Chicago's water works intakes. A little to the north one sees the Municipal Pier extending out into Lake Michigan nearly a mile. This structure is one of the

drive north through Lincoln Park is one of the most beautiful boulevards in America. Lincoln Park with its charming lagoons and quaint by-ways, its flower conservatory, zoölogical garden, athletic grounds, yacht harbor, bathing



Buckingham Memorial Fountain in full play

most modern of its kind. It serves as the docking terminal for the fleet of freight and passenger vessels which operate out of Chicago, and at the extreme end has a spacious recreational center where hundreds of Chicago families spend the hot summer days in the comfort of fresh lake breezes. Up Michigan Boulevard a few blocks are the Art Museum, the Public Library and the statue group, "The Spirit of the Great Lakes." The former ranks among the best art galleries in the country, containing excellent examples of old masters and modern paintings and a collection of sculpture both ancient and modern.

The Local Committee will make ample provisions for our members to see Chicago. The thirty miles of boulevards connecting up Chicago's park system makes an auto trip about the city a real pleasure. Chicagoans love and make real use of their parks. The lake shore

beaches, public golf course, and rifle range is a real playground for young and old, as well as a beauty spot such as few cities possess.

The wide south side boulevards which begin at Grant Park, pass by Field Museum and Soldiers' Field along the lake front, and lead to Washington and Jackson Parks—The latter was the site of the World's Fair over a third of a century ago. Connecting these two parks is the famous Midway of the fair days, now part of the boulevard system, on the north side of which are clustered the buildings of the University of Chicago. The new Medical School and the chapel are imposing additions to the university buildings group. Jackson Park is the largest of the city's parks. On its Japanese Island of the World's Fair days still stands Cahokia Court House, the oldest public building in the Mississippi Valley. The public bathing

beach, the golf grounds, tennis courts and yacht harbor offer splendid recreational facilities. Washington Park is known for its numerous athletic grounds, its flower conservatory with sunken gardens, and Lorado Taft's famous statue, the "Fountain of Time" at the west end of the Midway. On the west side Columbus, Douglas, Garfield and Humbolt Parks rival in beauty and public service those parks located on the lake front. They are all interconnected by boulevards and are notable for their beauty as well as their recreational facilities. The flower conservatories in Garfield Park are as beautiful as any in America. The seasonal flower shows held there attract national attention.

The public health activities in Chicago are many and varied. The local committee will arrange for the proper introduction of delegates and admission to places of interest. The health officers will find Chicago's Health Department activities a model of efficiency and service. Research workers in medicine and public health will be given the opportunity to see much of the work of their professional colleagues at such institutions as the Chicago, Northwestern and

Loyola Universities, the School of Medicine of the University of Illinois, and the McCormick Institute of Infectious Diseases. The Chicago Hospital clinics and Welfare stations will welcome our members. The public health engineers have offered them a wealth of interesting things to see in the activities of the Chicago Water Works, the Sanitary District of Chicago, and the milk and ventilation control work of the Health Department. The industrial hygienists will find much of interest to them in the great plants in the Chicago region, such as the Stock Yards, Western Electric Company, International Harvester Company, the Pullman Company, and the steel mills. The public health nursing activities, including welfare work, is splendidly organized in Chicago and Cook County. The public health group members in the Illinois District Nurses section are planning big things for the A. P. H. A. meeting this fall.

The Chicago meeting, in bringing together the representative public health workers of this continent, should be the high-water mark in the advance of the public health movement and begin a new era in the affairs of our Association.

A. P. H. A. AIDS CHAUTAUQUAS

The Association is coöperating with the Redpath and Swarthmore Chautauquas and the Milbank Memorial Fund in a program of public health education. This project is under the direction of the Committee of which S. J. Crumbine, M.D., is chairman. Lectures on public health and personal hygiene will be given under Chautauqua auspices in 291 small cities and towns in 14 north-eastern states. Edward T. Devine, M.D., who has been temporarily engaged by the Association to assist in the project is working in close coöperation with the official health authorities and voluntary agencies in the states concerned.

DR. DEACON IN TEXAS

W. J. V. Deacon, M.D., of the Michigan State Health Department has been temporarily loaned to the Association for service under the direction of the Committee on Registration Area. Dr. Deacon is now in Texas with the State Department of Health to assist it in entering the registration area.

PARKER BILL PROGRESS

The Parker Bill, which provides for correlation of federal health services, with minor changes has passed the Senate. These changes must be agreed to by the House of Representatives.

REGIONAL MEETING IN PORTLAND, ORE., JUNE 18

PLANs for the first regional meeting of the Association are rapidly taking shape under the direction of William C. Hassler, M.D., *Chairman* of the Temporary Organizing Committee for the West.

The other members of this committee are: E. T. Hanley, M.D., Vice-Chairman; John J. Sippy, M.D., Secretary; J. L. Pomeroy, M.D.; George Parrish, M.D.; James J. Waring, M.D.; Robert A. Peers, M.D.; H. B. Hommon; William P. Shepard, M.D.; H. E. Young, M.D.; F. D. Stricker, M.D.; and W. F. Cogswell, M.D.

The meeting will be held in Portland, Ore., on June 18. The program calls for a full day's session with a round table luncheon and an evening meeting. All members of the Association are invited to attend the meeting and to participate in the discussion.

The tentative program will include the following:

1. The Organization Objectives of the Western Branch. WILLIAM C. HASSLER, M.D., San Francisco, Calif.

Discussion, E. T. HANLEY, M.D., Seattle, Wash.

2. Effect on Native Population of Immigration of Physical Defectives. JAMES J. WARING, M.D., Denver, Colo.

Discussion, JOHN G. ABELE, M.D., Portland, Ore.

3. Is the Filipino a Menace from the Public Health Standpoint, and Should He Be Examined at the Point of Embarkation? F. D. STRICKER, M.D., Portland, Ore.

Discussion, DONALD J. FRICK, M.D., Los Angeles, Calif.

4. The Value of Health Centers. J. L. POMEROY, M.D., Los Angeles, Calif.

Discussion, WILLIAM DEKLEINE, M.D., Salem, Ore.

5. The Spread of Communicable Diseases from Transient Mexican Labor. GEORGE PARRISH, M.D., Los Angeles, Calif.

Discussion, JOHN J. SIPPY, M.D., Stockton, Calif.

6. How to Put Community Health Surveys to Work. W. F. WALKER, Dr. P. H., New York, N. Y.

The National Tuberculosis Association will hold its regular annual meeting in Portland during the week of June 18, and those travelling to this meeting from the East can take advantage of the summer tourist rates which are even lower than the 25 per cent reduction usually available to members attending Association meetings.

Further information concerning the regional meeting in Portland may be obtained from William C. Hassler, M.D., Department of Health, San Francisco, Calif.

NEW MEMBERS

Mrs. M. W. Ainsworth, Onawa, Ia., Red Cross County Public Health Nurse

Helen G. Andres, B.S., Baltimore, Md., Nutrition Director, Baltimore Dairy Council

Robert E. Andrews, M.D., Chicopee Falls, Mass.; with The Fisk Rubber Company

Maude R. Borda, R.N., Millville, N. J., Executive Nurse, Cumberland County Health Association.

Manfred Bowditch, A.B., West Lynn, Mass., Industrial Hygienist, General Electric Company

William P. Brown, M.D., Ardmore, Pa., Medical Director, Pennsylvania Tuberculosis Society

Reinaldo M. Camacho, M.D., Havana, Cuba, Assistant Professor of Bacteriology

Michael Cardillo, Los Angeles, Calif., Junior

- Food Officer, Los Angeles County Health Department
- I. N. Carter, B.S., M.S., Moscow, Ida., Assistant Professor of Civil Engineering, University of Idaho
- Jennie Evelena Caywood, R.N., Los Angeles, Calif., with Los Angeles County Health Department (Child Welfare)
- Mary Ella Chayer, R.N., Des Moines, Ia., Supervisor School Nurses and Director Health Education, Independent School District
- Alphonse J. Courtemanche, Los Angeles, Calif., Detailing Biology
- A. N. Crain, M.D., Rapid City, S.D., with Pennington County Health Department
- Bess E. Dalton, R.N., Orangeburg, S.C., County Public Health Nurse
- William R. Davis, A.B., D.D.S., Lansing, Mich., Director, Bureau of Mouth Hygiene State Department of Health
- Octavio de Oliveira, M.D., Rio de Janeiro, Brazil, Rural Sanitation Officer (Assoc.)
- Louis W. DesPrez, M.D., Chicago, Ill., Medical Director, Chicago Office, Life Extension Institute
- Edward T. Devine, Ph.D., Washington, D.C., Dean, Graduate School, American University
- Godias J. Drolet, New York, N. Y., Statistician in charge Research Service, New York Tuberculosis and Health Association
- Gertrude Dudley, Chicago, Ill., Director of Department of Physical Education for Women, University of Chicago (Assoc.)
- Harold J. Dvorak, Pontiac, Mich., Assistant Director of Public Health
- S. O. Fisher, D.V.M., Charleston, W. Va., Director Food and Sanitation, City of Charleston
- Clara R. Fritz, R.N., Woodhaven, N. Y., Teacher of Hygiene and Home Nursing in Continuation School
- G. L. Fugate, Houston, Tex., Principal Assistant City Engineer
- John A. Gosling, M.D., Tiffin, O., Health Commissioner
- Rae M. Handmacher, Los Angeles, Calif., Public Health Nurse, Los Angeles County Health Department
- Edward Hochhauser, New York, N. Y., Executive Director, Committee for Care of the Jewish Tuberculous
- Louis O. Home, M.D., Linneus, Mo., Deputy State Health Commissioner
- Syed Fakhruddin Husain-Khan, B.S., Ann Arbor, Mich., Student of Public Health (Assoc.)
- Erwin W. Johns, M.D., Ames, Ia., Student Health Service, College Hospital
- William J. Kirk, Wellsburg, W. Va. (Assoc.)
- Carl W. Larson, Chicago, Ill., Director National Dairy Council.
- Ada Louise Lockhart, Cincinnati, O., Nutrition Director Ohio Valley Unit of National Dairy Council.
- Clara Loitman, M.D., Boston, Mass., Supervisor of Nutrition Classes of Boston Public Schools
- William C. Masslow, M.D., Forest Park, Ill., Health Commissioner
- James H. McCall, M.D., Moundsville, W. Va., City-County Health Officer
- Cornelia McDonald, A.B., Chattanooga, Tenn., Director Southeastern Branch Laboratory
- Mary McGee, Brockton, Mass., Director of Nursing, Brockton Visiting Nurse Association
- Theodore Roosevelt Meyer, M.D., Parkersburg, W. Va., City Health Officer
- C. Wilson Miller, Columbia, S.C., Director of Vital Statistics
- M. Elizabeth Murphy, A.B., Middletown, Conn. (Assoc.)
- Asa Nakao, Ann Arbor, Mich., Student in Public Health at University of Michigan (Assoc.)
- Peter O'Shea, M.D., Worcester, Mass., Member Board of Health
- Pablo M. Otero, M.D., San Juan, P. R., Director Biological Laboratory, San Juan Department of Health
- Catherine McF. Peter, R.N., Los Angeles, Calif., Public Health Nurse, Los Angeles County Health Department
- Martha Peters, R.N., Ravenna, O., County Tuberculosis Nurse
- Benjamin M. Primer, M.D., New Iberia, La., Director, Parish Health Unit
- Blanche H. Rose, R.N., Grand Rapids, Mich., Executive Secretary, Grand Rapids Anti-Tuberculosis Society
- Louis Saur, M.D., Norwood, O., Health Commissioner
- Dora E. Snyder, B.S., Jefferson City, Mo., Assistant Bacteriologist, State Board of Health
- Frank M. Sulzman, Troy, N. Y., Training Schools, Troy Hospital and Cohoes Hospital
- Mary W. Taylor, B.S., Chicago, Ill., Librarian, Elizabeth McCormick Memorial Fund
- Grace Theodoropoulos, St. Louis, Mo., Educational Director, Pevely Dairy Company
- Leslie Waddill, D.D.S., Pittsburgh, Pa., Member Pittsburgh District Dairy Council
- Carl J. Wallen, D.V.M., Redlands, Calif., Field Veterinarian
- George Walter, M.D., Boston, Mass., on Staff of Life Extension Institute (supervising in-

dustrial and other examinations)
 Ruth Cole Warwick, M.D., Westmoreland
 Depot, N. H. (Assoc.)
 Alice J. Whittier, R.N., Delaware, O., Public
 Health Nurse
 Verna Willis, M.S., Jefferson City, Mo., Assist-
 ant Bacteriologist, State Board of Health
 Laboratory
 Belle Wood-Comstock, M.D., Los Angeles,
 California, Chairman of Public Health, Los
 Angeles District of California Federation of
 Women's Club

DECEASED MEMBERS AND FELLOWS

Clarence W. Bassett, M.D., Sharon, Conn.
 Member, elected 1920.

Chauncey F. Chapman, M.D., Lincoln Health
 Dept., Lincoln, Nebr. Member, elected 1920.
 H. A. Duemling, M.D., Fort Wayne, Ind.
 Member, elected 1920.
 Perry D. Gaunt, M.D., District Health Dept.,
 Sheboygan, Wis. Member, elected 1923.
 Prof. James O. Jordan, Boston, Mass. Mem-
 ber, elected 1905, Fellow 1922.
 Francis M. Munson, M.D., La Plata, Md.
 Member, elected 1924, Fellow 1927.
 Mrs. S. R. Prentiss, Bangor, Me. Member,
 elected 1912.
 Tom Rosenfield, Rock Island, Ill. Member,
 elected 1921.
 Dr. F. H. Lee, Canaan, Conn. Member, elected
 1919.

LETTER TO THE EDITOR

TO THE EDITOR:

Realizing, in the summer of 1925, that Tampa, Fla., should have a modern health department, the City Commissioners endeavored to secure as health officer the best man they could find. Once this became known, they were swamped with applications. Unable to decide among these, they sought the advice of the Board of Trade's Committee on Public Health and Hospitals.

The name of E. C. Levy, M.D., formerly Chief Health Officer and later Director of Public Welfare of Richmond, Va., was not in the list of applicants, but the outstanding character of his work, his national reputation, and the endorsements which their own inquiries brought from high sources led the committee to make a unanimous recommendation in his favor. The City Commission proffered the position to Dr. Levy and he became City Health Officer of Tampa in September, 1925.

He found an utterly demoralized situation. A few employees, without head or organization, constituted the Health Department. Many and peculiar diffi-

culties had to be met. For example, during this period any public statement relating to bad sanitary conditions which needed correction or to the prevalence of contagious disease was resented in certain quarters as harmful to the community. This was shown during the smallpox outbreak which started when Dr. Levy had been here only a little over three months. But here, as always, he stood his ground. He won his fight, both against this opposition and against the epidemic.

When Dr. Levy came to Tampa, the milk supply was about as bad as can be conceived. All previous efforts to improve the situation had failed. Our efforts to secure results through the health authorities had brought about little or no improvement and we had almost lost hope. Frankly, we were at first discouraged at the deliberate manner in which Dr. Levy went at this particular problem, but he called attention to the lack of success which had attended previous lines of action and asked for reasonable time to show results. He outlined his program and

showed how each step had to be established before the next could be taken. As the difficulties were overcome, one by one, those who had doubted were convinced. Tampa has now a thoroughly satisfactory milk supply.

Never discouraged, never yielding to popular clamor either in the direction of courting failure by undue haste or of letting up in a course once decided upon, he succeeded not only in giving Tampa the kind of health department that she had so long needed, but also in winning over those who had been indifferent.

By whatever standard measured, Dr. Levy made good. No single thing perhaps can better substantiate this claim than the practically unanimous endorsement of his work by the medical profession of Tampa. Since his retirement the Hillsborough County Medical Society has elected him an honorary member and is planning to give him a testimonial dinner.

The real purpose of this communication is to make it plain that politics, and politics alone, is responsible for the fact that Dr. Levy is not still in office. Tampa has recently been through a heated and long-drawn-out political campaign. As in many other Florida cities, collapse of the boom brought about conditions which were improperly attributed to the local government. In Tampa this went so far as to cause attacks not only on the City Commissioners but on commission government itself. Finally the people voted in favor of a charter giving Tampa the old system of a city council elected by wards, under the name of "representatives" elected by "districts."

This change in the basic form of government was the only issue considered by the people in voting for the new charter. But in this new charter there is a section relating to the City Health Officer. No training or experience in public health work is required, but he must be a "physician authorized to

engage in the practice of medicine under the laws of the State of Florida." The County Medical Society, through a committee, protested against this provision before the board which was drafting the charter, but this protest was ignored. The people of Tampa had no opportunity to express their views on this particular section. They could only accept or reject the charter as a whole.

Dr. Levy had not, of course, taken the examination of the State Board when he came to Florida to accept the position of City Health Officer of Tampa. At that time Tampa did not have, and no other Florida city at the present time has, any such requirement, nor does the state demand this of its health officer. Even had Dr. Levy been disposed to do so, he had no opportunity to meet this requirement after the adoption of the new charter, since no meeting of the State Board of Medical Examiners was held in the short interval between that time and the time that the charter went into effect.

No reason for not reappointing Dr. Levy was given except that he was ineligible under the new charter.

Tampa has thus, purely through politics, lost a splendid health officer, one who, in the two years and four months that he was in office accomplished great things under most abnormal and trying conditions and who, had he been allowed to continue, would beyond question have given Tampa the same reputation for advanced public health work which, through his efforts, has been enjoyed by his native city of Richmond.

In order not to be misunderstood, I wish to state that I knew Dr. Levy only by reputation before he came to Tampa and since then only through his work here. Such things as have recently happened here and in Chicago should not be.

JOHN H. MILLS, M.D.
907 17th Avenue,
Tampa, Florida.
March 24, 1928.

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

Smallpox Prevention in New Haven—There have only been 11 cases of smallpox in New Haven during the past twenty years, and none during the past three years until the recent case in January. (There was 1 case reported in January and none in February, 1928.)

As the people of New Haven were exposed to 5 different cases of smallpox during the month of January, only one of which was a resident of the city proper, a determined effort was made to secure the vaccination and revaccination of the city's inhabitants. Of the 5 cases referred to, 2 were in an institution in West Haven, 1 was in the town of Hamden, and the 4th lived about twenty-five miles from New Haven, but was in New Haven up until the onset of the disease.

It is estimated that 100,000 people were vaccinated, 45,000 by the health department, and 55,000 in the industrial plants and by private physicians. There has been no spread of infection. The cost to the city of New Haven including hospitalization will probably be under \$7000.00. The percentage of "takes" in what was considered a well vaccinated community was surprisingly high as shown by figures compiled by the University Health Service, which organization vaccinated 2138 individuals. Of this number 1744 were satisfactorily followed, and of this latter group there were 790, or 47.5 per cent, who gave evidence of a "take"; 808 or 48.7 per cent were immune, indicating protection from smallpox from previous vaccination, and 63 or 3.8 per cent were failures from the first attempt. Those in this last mentioned group were revac-

inated. (The experience of New Haven, which has always been considered a well vaccinated community, and which has religiously practiced vaccination among school children, again indicates that no community can be adequately protected against smallpox unless it practices not only vaccination but revaccination. Had hemorrhagic smallpox secured a foothold in New Haven the result might have been as disastrous as Detroit's experience in 1924. Revaccination is essential.)—John L. Rice, M. D., Prevention of Smallpox Epidemic; *Monthly Bull.*, New Haven Department of Health, LV, 2 (Feb.), 1928.

Tennessee Manual for County Health Departments—Under the direction of Dr. E. L. Bishop, State Health Commissioner of Tennessee, Dr. Joseph W. Mountin has compiled a most interesting manual for the conduct of County Health Departments in the State of Tennessee. The powers and duties of local Boards of Health are defined and particular emphasis is laid upon the relationship between the local units and the state department of health. The administrative features are given in considerable detail. (The reviewer has never seen a more complete document which outlines in a concise and clear manner the organizational features and the control procedures to be followed in a local rural health unit which depends for its existence largely upon a supervisory control system emanating from a state department of health. The manual has appeared in mimeograph form and consists of 165 pages of information which is invaluable to the rural public health administrator.)

Manual for Conduct of County Health Departments, Tennessee State Department of Public Health, Dr. E. L. Bishop, Commissioner.

Diphtheria—"How Complete is Our Protection?"—The *Health Officers' News Letter* issued by the Committee on Administrative Practice for March, 1928, presents some very interesting figures, supplied by the health officers in cities of 10,000 population and over, showing the percentage of preschool and school children immunized against diphtheria. Information was secured from 129 cities, representing a population of over 14,000,000. It was found that approximately 12 per cent of the preschool children in this group are protected against diphtheria and 33 per cent of the grade school group.

The immunization program appears to have been more extensive in Eastern cities over 70,000 among the school age group where the highest percentage of immunity occurs (42.7 per cent), while the lowest percentage (6.4 per cent) is among the preschool children in Western cities from 10,000 to 30,000 population.

From the tabulation carried in this report it is obvious that:

. . . our diphtheria immunization program has not yet attained such a degree of completeness that we may rest content. The percentage of grade school children still susceptible is sufficiently high to permit the occurrence of a large number of cases, or even a modest epidemic, as did in fact happen in many communities last year. Under existing circumstances the preschool population cannot escape. Health officers would do well to bring these facts before their communities and to encourage a system of reporting successful immunizations so that the local progress of prevention can be charted, without which we proceed blindly in our campaign for greater use of toxin-antitoxin. . . .

Public Health Administration in New Jersey—In 1864, largely through the influence of Dr. Ezra M. Hunt, who was one of the pioneers in the public

health movement in that state (who became the tenth President of the A. P. H. A.), the New Jersey legislature appointed a state commission to report upon the general sanitary conditions of that commonwealth. The Civil War retarded progress in sanitary matters, but a second commission was appointed in 1873 with the same chairman. In 1877 the State Board of Health was created and Dr. Hunt was appointed its secretary. In 1880 a law was passed making compulsory the formation of local boards of health.

The major activities of the state board during the decade ending in 1890 were concerned largely with outbreaks of smallpox, diphtheria and typhoid fever, together with the ever-present malaria which probably included the fevers of obscure origin which were supposedly due to the miasm generated in the marshlands of the Passaic and other river valleys. During the next decade there was a more concerted search for the causes of disease and the isolation of those suffering from specific communicable infection. Isolation hospitals under health board management were advocated. In 1895 a law was enacted requiring physicians to report certain communicable diseases to local health boards. The typhoid fever death rate was reduced from 54 per 100,000 in 1890 to 18 in 1900. There was a great advance in sanitary engineering practice with special emphasis upon the prevention of water-borne typhoid fever.

Soon after the beginning of the new century there were legislative acts providing for medical examination of school children, and creating the State Sewerage Commission. During this decade laboratory service expanded, largely through the influence and energetic work of R. B. Fitz Randolph. The number of local sanitary districts had grown from 200 in 1880 to 434 in 1902.

In 1908 the State Board of Health

was reorganized and combined with the State Sewerage Commission. In 1911 the staff of the State Board of Health consisted of 45 employes, and by 1920 it had increased to 150. In 1915 the State Board of Health was succeeded by the State Department of Health.

Sedgwick played a leading part in the progressive trend of health work in New Jersey through the influence of his students, trained sanitarians, among whom were Parker, Winslow and Wells, at Montclair and Gunn, Osborne, and McNutt in "The Oranges."—D. C. Bowen, *A Half Century of Public Health in New Jersey*, *Pub. Health News*, Dept. of Health, New Jersey, XIII; 35 (Jan.-Feb.), 1928.

Michigan Health Officers' Manual—Rules and regulations for the control of communicable diseases revised and adopted January 1, 1928, have been published by Dr. Guy L. Kiefer, Commissioner, Michigan Department of Health. The bulletin which consists of some 60 pages is divided into four sections, the first of which deals with general considerations involved, including the authority given to the State

Health Commissioner and the State Advisory Council of health in promulgating regulations. There are then propounded certain questions which frequently arise in the mind of the layman with respect to the control of communicable diseases, and these are answered in full.

The second section deals with the scope of the code and specifies the diseases which are declared to be reportable.

The third section consists of definitions of such important control measures as quarantining and isolation, and the general practice to be pursued with respect to carriers, contacts, exclusion from school, and the supervision of contagious diseases on dairy farms.

The fourth section gives the detailed procedure for the administrative control of each communicable disease.

(The code is not unlike that adopted by the American Public Health Association, but is to be especially commended for the clear and concise manner in which the regulations have been enumerated.)—Dr. Guy L. Kiefer, Commissioner, Michigan Department of Health, *Health Officers' Manual*.

LABORATORY

C. C. YOUNG

DISSOCIATION OF THE RAWLINGS STRAINS OF *B. TYPHOSUS*

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THE tendency toward dissociation of bacteria in general and of the organisms of the colon-typhoid group in particular is well recognized; yet very little attention has been paid to the question of the extent of variation or to the significance of many of the varieties encountered. When the bacterium under consideration is other than an animal or human pathogen, the time required for a complete and careful study can well be afforded, but when organisms of such immunological significance as those of the Rawlings strain of *B. typhosus* are concerned, such discoveries as have been made should be applied as quickly as possible. Certainly, uniformity in the cultures of this strain, used in practically all laboratories for the production of the antityphoid vaccine, should be a prime requisite. The prescription of this strain was obviously intended to satisfy such a condition, yet the evidence found in the literature of the past decade is scarcely necessary to indicate to what an extent the facts fail to correspond to the theory. Many who have had occasion to work with two or more subcultures of *B. typhosus* Rawlings have noted certain differences. Such observations have seldom been published, but a study of Robinson's²⁻³ two papers on antigenic differences in strains of *B. typhosus* is sufficient to indicate the wide differences that occur. This knowledge of variations even within a well-studied and much used bacterial strain

only awaited the development of the subject of "Microbic Dissociation" for its explanation and extension.

There is no need in this paper to enter into a discussion of "Microbic Dissociation." Hadley¹ has thoroughly covered the subject. It may be well, however, to indicate briefly some of the major conceptions, first of which is the well established fact that bacteria may and do vary. Within a well established species wide differences in colony appearance, biologic activity, antigenic and physiological characters may exist. However one may feel about accepting the concept of extremes of variation characterized by the S (smooth or normal type) and the R (rough or extreme variant) and the many intermediate forms less definitely described, one cannot help but consider the data which show variations in virulence and antigenic powers associated with certain colony forms. Assuming for the present, that one can definitely separate at least two types, how are they to be recognized? The distinguishing characteristics of the two types, S and R, are mentioned in the following Table I taken from Hadley's review.

Other characteristics might be included, but the above are sufficient for present purposes. While these properties of the two variants serve to identify them, they have other significances which may be readily noticed. Outstanding among these are their virulence

and transformations in immune serum. To come directly to the point about which this paper is solely concerned, the R type, being the less virulent, that therapy or prophylaxis is best which assures a transformation from the (virulent) S to the (non-virulent) R type or at least which will not interfere with what is apparently a *normal* transformation in this direction. In the same sense, that organism which produces an antiserum in which the S (virulent) type is transformed to an R (non-virulent) type and in which there is no tendency for the R types to become S forms, is the one which should be used in the preparation of antityphoid vaccines. In other words, the use of any form other than the S type in vaccines is, on the basis of such evidence as we now possess, unwarranted. With these facts in mind, an investigation of several cultures of *B. typhosus* Rawlings was undertaken not alone to determine what type was actually in use in various laboratories, but to verify certain of the statements made above, particularly those referring to transformations in immune sera. The relative virulence of the two types is apparently well-established, especially in view of the recent contributions of Webster and Burns.*

TABLE I

S TYPE

Homogeneous clouding in broth
Normal suspension in 0.8% salt solution
Colonies, smooth, regular, convex
In motile species, active
Carries double antigen (S and O)
If a pathogen—virulent
Sensitive to bacteriophage
Transformed to R in S immune serum
Not transformed in R immune serum

R TYPE

Agglutinative growth in broth
Sedimentary suspension in 0.8% salt solution
Colonies rough, irregular, flat
In motile species, non-motile
Often pure R (may have some O or S)
Slightly or non-virulent
Less sensitive to bacteriophage
Not transformed in S immune serum
Transformed to S in R immune serum

EXPERIMENTAL

Six agar slant cultures of *B. typhosus* Rawlings, subcultures from the strain used in the preparation of vaccines, were received from as many laboratories. Although the various examinations were made as soon as possible after receipt of the cultures, lest the objection be raised that variation occurred during the investigation, transfers were made on agar slants which experience has shown tends to prevent variation for a time at least. Table II

TABLE II

Strain	Colony Type	Growth in broth	Motility	Agglutination in 0.8% salt sol.	Susceptibility to bacteriophage	Agglutination with antisera		Per Cent Transformation ¹ in 10% immune serum broth		Per Cent Transformation in blood broth	Virulence*
						S	R	S serum	R serum		
1	R	Settles	—	Partial	++++ ²	+	—	50%S	50%S	50%S	—
2	R	Turbid	—	None	++++	+	—	20%S	40%S	60%S	0
3	S	Turbid	+	None	++++	+	+	40%R	40%R	100%R	0
4	R	Turbid	+	None	++++	+	+	20%S	70%S	50%S	0
5	R	Turbid	—	Partial	++++	+	—	30%S	30%S	10%S	+
6	R	Turbid	+	None	++++	+	—	30%S	30%S	50%S	+
S	S	Turbid	+	None	++++	+	—	90%R	10%R	100%S	+
R	R	Settles	—	Complete	++++	—	+	30%S	90%S	90%S	—

1. Maximum: based on colony appearance

2. +++++: complete lysis

* Virulence for guinea pigs using two 18-hour slants, intraperitoneal injection

gives the results of these examinations. Two other cultures are included. These have been under observation for several months and are considered representative S and R types, respectively. They were used in the preparation of the R and S. antisera used.

Some further information is necessary before entering into a discussion of the results shown in Table II, especially concerning colony types. No single criterion for the identification of the culture type is so significant as the colony appearance. In many investigations little or no effort is made to go further than to record the colony appearance. That such a procedure is ill-advised can be readily seen from the data presented here. Apparent R types proved on further study to possess many of the characteristics of the S form. Examination of the colonies formed by the above cultures revealed several facts not shown in the table. Each of the strains referred to was apparently homogeneous. There were no variations among the colonies of a single strain when freshly subcultured from an agar slant. On the other hand, the so-called R types were by no means identical. Strain 1 most closely resembled the stock R, while strain 3 was indistinguishable from the known S form. The other four most decidedly favored the R type in appearance. With the exception of 1, all of the strains grew in broth in a manner resembling the S type. Motility tests are misleading because of the fact that here individual bacteria rather than masses of bacteria must be considered. One can usually find some motile organisms in any type of a motile species. However, the difference between the stock S and R was sufficiently marked so that a similar difference determined the question of positive or negative motility with the other strains.

It is not within the province of this paper to consider such theoretical and controversial subjects as the relation of

agglutinability or susceptibility to bacteriophagy, to dissociation. Nor indeed do the few virulence tests performed shed much light on the virulence of the strains tested. If, however, each of the strains is considered with respect to all the data presented, it is possible to reach a conclusion as to its nature. Strain 1 most closely resembles an R type and it is likely that the majority of investigators with experience in this field would classify it as such. Strain 3 would be called an S type. The other four strains cannot be classified as S or R. They have certain attributes of both types, yet one conclusion, at least, can be made. *Five of the six strains studied were not S types.*

There remain to be considered two questions, one of which was raised earlier in the paper: does growth in R immune serum tend to prevent the S→R transformation and to promote the development of S types from R; and how may one obtain the S type for use in the preparation of vaccines. The literature contains but one paper dealing with the first question. Soule⁴ working with *B. subtilis* showed that there is a tendency of R antiserum, not only to preserve the S type as such, but to bring about the R→S transformation. The same writer while recognizing the futility of generalization points out that should these conclusions hold for pathogenic organisms, there is a very real danger from attempting artificial immunization with R type strains. To consider typhoid fever as an example, two situations may be imagined, one in which the individual is invaded with R type organisms, as more frequently happens if carriers are the source of the bacilli; the other where an S type bacillus is concerned. In the first instance, the serum being anti-R, S type organisms result from the invasion. In the second, there is no tendency for the less virulent R type to be formed as happens when anti-S serum is present.

Referring again to Table I, it will be seen that, grown in 10 per cent S serum broth, S type organisms dissociate to R. This fact finds ample confirmation in the literature (Hadley). R types have a tendency to remain as such. It will be seen that even here there is some reversion of R→S, but comparison with growth in normal and R immune serum broth shows it to be relatively slight. In R and in normal serum broth, the S type remains S while the R has a very marked tendency to become S.

S types for immunization purposes may be produced by growth of the strain in question in R anti-serum. Frequently, however, such serums are not available, and some strains are less affected than others by such treatment. That animal passage gives a satisfactory solution to the problem is indicated by the following experiment. Cultures from several R type colonies were injected intraperitoneally into guinea pigs using the washings from two agar slants. Twenty-four hours later, heart's blood cultures were taken from dead as well as surviving animals and in none of 26 cultures was an organism other than *B. typhosus* obtained. All of the organisms were of the S type with the exception of those obtained from the animals receiving the stock R culture. Todd⁶ observed that extreme R type cultures of hemolytic streptococci would not revert to S types on animal passage. The result of

the above experiment would indicate that the same is true for typhoid strains. Except when extreme dissociation has occurred organisms may be converted into S types. Thus, it is recommended that frequent animal passages should be made of cultures of *B. typhosus* Rawlings if they are to be used in the preparation of anti-typhoid vaccines.

CONCLUSIONS

Five of 6 strains of *B. typhosus* examined with respect to their degree of dissociation were found to be other than S type.

The report of Soule that growth of R types in S immune serum results in the production of S types, and that the tendency of S types to dissociate to R is inhibited by such serum was confirmed for the typhoid bacillus.

Passage of forms other than the extreme R type through guinea pigs results in a reversion to pure S types.

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VITAL STATISTICS

LOUIS I. DUBLIN, PH.D.

Infant and Maternal Mortality in the United States—In the period for 1915 to 1924 there was a decrease of 29 per cent in the total infant mortality rate in the registration area. The decreases in the rates for the urban and rural areas were very similar—30 per cent for the urban and 27 per cent for the rural. The improvements in the rate for white infants in the total registration area, in the urban area, and in the rural area are strikingly similar—32 per cent, 32 per cent, and 31 per cent respectively. The mortality rate among colored babies in the country has decreased 42 per cent in the decade under consideration. This is interesting in view of the fact that undoubtedly no class of the infant population has been less affected by so-called infant welfare work.

Unfortunately the United States cannot show a downward trend in maternal mortality. There was a rise of 8 per cent in maternal mortality from all puerperal causes in the total registration area from 1915 to 1924. In urban areas there has been a rise of 14 per cent—from 6.4 to 7.3 per 1,000 live births. The rural areas show an increase of 5 per cent. The only decrease shown in the maternal mortality from all puerperal causes is in the rate for white mothers in rural sections, which has fallen from 5.5 to 5.1—a decrease of 7 per cent. In the total registration area the rise in the rate for whites is very slight—less than 2 per cent—but in urban areas alone the rise has been 11 per cent. The rates for colored mothers show increases in the total registration area, in the urban, and in the rural area, of 11 per cent, 17 per cent, and 34 per cent, respectively. Deaths from puerperal septicemia com-

prised over 36 per cent of the total maternal mortality. Though there is a slight increase from this cause in the total urban rate and in the rates of white city women and colored country women, in every other instance the rates show a tendency either to fall or to remain more or less stationary. In other accidents of labor (puerperal hemorrhage having been eliminated) and albuminuria and convulsions—there seems to be a slight rising tendency. The rate for the former has risen 13.3 per cent and for the latter more than 7.5 per cent.—E. Blanche Sterling. *Pub. Health Rep.* 43:497-503 (Mar. 2), 1928.

Demographic Statistics for Germany—The average length of life, in 1900-1911, in the German empire was 49 years. The total number of deaths dropped from 1,261,000 (30.6 per 1,000) in 1872, with some fluctuations of the total, to 1,206,000 (22.5 per 1,000) in 1897, and to 1,154,000 (18.1 per 1,000) in 1909, the year in which, for the last time, more than 2 million births were recorded. In the last normal year, before the World War (1913), the number of deaths had dropped to 1,061,000 (15.8 per 1,000). In 1923, 1924 and 1925 the total number of deaths was, respectively, 901,000 (14.6 per 1,000), 802,000 (12.9 per 1,000), and 788,000 (12.6 per 1,000).

The birth rate increased up to 1901, since which year there has been a decline. From 1872 to 1874 the total number of births ranged from 1,700,000 to 1,750,000, and from 1875 to 1890 the range was between 1,750,000 and 1,840,000. Between 1891 and 1897 it rose, with slight fluctuations, to 1,991,000.

The decade from 1898 to 1909 showed the greatest annual totals of births; they run over 2 million. Since 1909 the figures have again slowly declined to 1,874,000 in 1914. The years 1923, 1924 and 1925 showed a more uniform picture, the total births in those years having been, respectively, 1,340,000, 1,314,000 and 1,335,000. Comparative figures reveal a slow decline in the birth rate from 40 plus per 1,000 population up to 1879, to 38 per 1,000 in 1888 (38 was reached again in 1891 and 1893). In 1899 the rate fell to 37 and in 1902 to 36.2 per 1,000. In 1906 a rate of 34 per 1,000 was attained for the last time; in 1908 the rate dropped to 33. Then the rate dropped abruptly to 27.6 during the second, the last normal, quarter in 1914. From 1923 to 1925 the figures are fairly uniform: 21.7, 21.1 and 21.3, respectively. The larger cities in spite of a high percentage of marriages, had only 14.2 living births per 1,000 of population; Berlin had a birth rate of only 9.5. The rural sections are rapidly coming to follow the example of the larger cities and the upper classes. In 1898 the excess of births over deaths for the German empire was 15.6 per 1,000 population (the highest figure); the average figure for the period 1871-1880 was 11.9; for 1881-1890, 11.7; for 1891-1900, 13.9, and for 1901-1910, 14.3. For 1913 the last normal year before the war, the excess of births over deaths was only 12.4 per 1,000. The excess of births over deaths in 1920 was 10.8, and in 1921 it rose even to 11.3. But even this peak of the postwar figures was under the figure for 1913. During the period from 1922 to 1925 the figures were fairly uniform, ranging around 8.1 per 1,000, as follows: 8.5, 7.1 (height of the economic depression due to the decline of the mark), 8.2 and 8.7, respectively. The birth rate and the death rate are both declining, but the birth rate is declining more rapidly than the death rate. —*J. A. M. A.*, 90:787 (Mar. 10), 1928.

Maternal Mortality in Canada—The special inquiry into maternal mortality in Canada has been completed after several years of study and the report was issued at the beginning of this year. There were 237,199 living births from July, 1925, to July, 1926, and 1,532 of the mothers died from maternal causes, giving a mortality rate of 6.4 per 1,000 living births. The ages of these mothers varied between 15 and 48 years with an average age of 31.1 years. Three hundred and forty-nine were primiparae and 963 were multiparae. These latter 963 mothers left 4,305 motherless children, an average of 4.5 children per mother.

In 385 cases (25 per cent of total) the birth occurred in a hospital; 48, or 3 per cent, were attended by midwives. In 128 cases, or 8 per cent, of the total the doctor was not called until the patient was in labor. In 27 cases the doctor was not called until the patient was dying and in 91 the doctor was not called until several days after the birth, while in 101 there was no doctor present at any time during the birth or after it. Only 230, or 15 per cent, of the mothers had any prenatal care and in 40 of these the instructions were not followed. In 110 cases, death occurred before labor began.

Puerperal septicemia was given as the cause of death in 418, or 27 per cent, of the cases but this percentage would probably be raised if the histories had been more fully given in some cases. Hemorrhage was given as the cause of death in 357, or 23 per cent, of the total, heart disease in 226 cases, and eclampsia in 195 cases. Influenza and pneumonia, singly or together, had an influence on the mortality in 132 cases, tuberculosis in 96, embolus and dystocia in 87 each, nephritis in 80, placenta praevia in 76, shock in 63, anemia in 44, ectopic pregnancy in 33, phlebitis in 22 and venereal disease in only 9 cases. Previous pregnancies, too frequently and at too short

intervals, were mentioned in 19 cases, 67 patients were called overworked with the care of their other children and the home and 27 said to have had insufficient sleep and rest. The general health of the patient was given as poor or bad in 153 cases, 30 had serious infections of the teeth, and 10 infected tonsils.

Forceps were used in 289 cases, or 19 per cent of the total, and 136 operations were performed. Pituitrin was used in 327 cases, or 21 per cent of the total and rupture of the uterus was reported in 3 of these cases. In 5 cases it was used before labor, in the first stage in 9 instances, in the second stage 123 times, and in the third stage, in 32 cases and postpartum in 50 cases. During or after caesarian section it was used in 11 cases.—Department of Health, Canada. *Pub. No. 37. The Little Blue Books National Series No. 1, 1928.*

Vital Statistics in Connecticut, 1927—Connecticut in 1927 had the lowest death rate in the 78 years for which the vital statistics of the state are available, according to a provisional summary issued by the State Department of Health. The death rate last year was 10.5 for each 1,000 population, or 16,661 deaths in an estimated population of 1,586,435. During the same year 28,473 births were reported. In 1925 the death rate was 11.6; in 1924 it was 11.3 and in 1923 it was 12. Last year's records also show the lowest infant mortality in the history of Connecticut, 60 per 1,000 live births.

The death rate from typhoid fever during 1927 reached a new minimum of 1.1 for each 100,000 population, there being 17 deaths in 1927 against 29 deaths, a rate of 1.8, from this disease in 1926. The typhoid death rate has been falling steadily from a maximum of 41.8 in 1890. The 1927 death rate for measles showed a sharp drop, from 195 deaths, a rate of 12.5 for each 100,000 population, in 1926, to 21 deaths, a rate

of 1.3 in 1927. The scarlet fever death rate shows a steady decrease, from 53 deaths, a rate of 3.6 in 1923 to 22 deaths, a rate of 1.4 in 1927. Whooping cough during 1927 had the lowest death rate in the history of the state, there being 40 deaths, a rate of 2.5 and in 1926, 95 deaths, a rate of 6.1. The death rate from diphtheria showed an increase in 1927 over that of 1926. The total deaths in 1927 were 94, a rate of 5.9; compared with 83 deaths, a rate of 5.3 in 1926. The 1927 diphtheria death rate is next to the lowest in the history of the state, the 1926 rate being the lowest on record, the lowest rate until that time having been 8.2 in 1921. The highest diphtheria rate recorded was 97.7 per 100,000 in 1889. In 1923 there were 187 diphtheria deaths, a rate of 12.7; in 1924, 168 deaths, a rate of 11.2 and in 1925, 126 deaths, a rate of 8.2.

The death rate from influenza in 1927 was 18.8, but little more than half the 1926 rate of 35.9. There has been a downward trend in the tuberculosis death rate since 1918, but the number of cases for the last five years has been practically stationary. Last year there were 925 deaths from pulmonary tuberculosis, a rate of 58.3 and 134 deaths from other forms of tuberculosis, a rate of 8.4. There was a distinct upward trend in the cancer death rate to 1925, but since that year, because of some unknown factor, the death rate has been practically stationary. There were 1,646 cancer deaths a rate of 107.6 in 1925; 1,663 deaths, a rate of 106.7 in 1926 and 1,683 deaths, a rate of 106.1 in 1927. The pneumonia death rate in 1927 was very low, 84.4, the first time in recent years, according to Commissioner Osborn, that the rate has been below 100. In 1926 there were 1,693 deaths, a rate of 108.6. In 1927 there were 1,339 deaths.

Poliomyelitis showed an increase from 6 to 16 deaths from 1926 to 1927, due to the outbreak last year, and the death

rate showed a corresponding increase from 0.4 to 1.0. Cerebrospinal meningitis had a death rate of 0.6 for both 1926 and 1927, there being 10 deaths from this disease in each year. The lower infantile mortality rate in 1927 was in a considerable measure due to the drop in the death rate of children under 2 years old of diarrhea and enteritis from 16 in 1926 to 11.1 in 1927. There were 188 suicides in the state in 1927, a rate of 11.9 per 100,000, while during the preceding year there were 216 deaths, a rate of 13.9, which was the highest for the 5-year period. Deaths from accident in 1927 numbered 1,051, a rate of 66.2, the lowest for the 5-year period. The highest accident death rate during the 5 years 72.6, representing 1,111 deaths, was in 1925.—*Hartford Courant*, Feb. 4, 1928.

Correlations Between the Death Rate from Diabetes Mellitus and Certain Demographic Factors—An inquiry into the relationship between the diabetes death rate and some demographic factors in various localities showed the following numerically significant correlations:

There was a high negative correlation with the percentage of negroes in the population. In 66 large cities this was -0.538 with the coefficient 9.1 times its probable error; in 34 states it was -0.731 and the coefficient 13.5 times its probable error. There was a positive partial correlation in the large cities with the percentages of the total population born in Ireland ($+0.561$), Germany ($+0.325$), Italy ($+0.380$), and Russia ($+0.441$). The zero order correlation with the percentage of Polish population was insignificant, but correction for age gave a first order coefficient of $+0.410$ which was 5.9 times its probable error.

The zero order correlation between the diabetes mortality (corrected for age and sex) and the proportion of the

population filing income tax returns was $+0.727$ which is 13.2 times its probable error. The correlation with the cancer death rate was $+0.842$, which was 38.3 times its probable error. Tuberculosis of the lungs had a significant negative correlation and organic heart disease a significant positive correlation, acute nephritis and Bright's disease and pneumonia have insignificant correlations, the former correlation being negative and the latter positive. The correlation with incidence of defective and deficient teeth among drafted men was $+0.314$ almost 3.0 times its probable error, correction for percentage of population residing in urban areas reduces this to $+0.052$ which is 0.4 times its probable error. The correlation of the age- and sex-adjusted death rate from organic heart disease with the incidence of defective and deficient teeth gave a coefficient 5.5 times its probable error. Both diabetes and cancer mortality show significant positive correlations with the incidence of obesity among drafted men, the diabetes coefficient being 4.6 times its probable error and that of cancer 6.2 times the probable error.—Robert Jordan, *Am. J. Hyg.* 8:55-67 (Jan.), 1928.

The Age Distribution of Poliomyelitis—Approximately 50 per cent of all cases of poliomyelitis occur under 5 years of age, 80 per cent under 10 years, 90 per cent under 15 and 95 per cent under 20 years in urban communities, but in rural areas it is more evenly distributed through the older age groups. A comparison with measles and diphtheria showed the age distribution of the three diseases to be of the same order and the incidence in the various age groups to be directly proportional to concentration of the population.

There is strong inferential evidence that the majority of individuals become immune to the virus of poliomyelitis and that this immunization takes place relatively earlier in life with increased

density of population, supporting the theory that the virus is spread by contact to a great extent through abortive cases and healthy carriers. The frequency with which the different viruses cause disease or subclinical immunity has been formulated as follows: of susceptible individuals exposed to measles 1 out of 1 develops the disease; of those exposed to diphtheria 1 out of 10 develops the disease and 9 out of 10, subclinical immunity; of 100 susceptible individuals exposed to poliomyelitis 1 develops the disease and 99 subclinical immunity. Consequently there are no healthy measles carriers, in diphtheria there are about 9 potential healthy carriers to every case, and in poliomyelitis about 99 carriers to each recognized case.—W. Lloyd Aycock—The Significance of the Age Distribution of Poliomyelitis. Evidence of Transmission through Contact.—*Am. J. Hyg.* 8:35-54 (Jan.), 1928.

A Study of the Use of Convalescent Measles Serum in Children's Institutions—There were 945 cases and 51 deaths from measles in 40 children's institutions in New York State in 1923. Seventy-seven per cent of the deaths were in children under 3 years of age, about the same proportion as in the state at large. There were no deaths among the 6 cases in children less than 6 months of age. The highest fatality rate was in children between 6 and 11 months of age, after this age it declined rapidly. There were only 3 deaths among the 560 cases in children aged 5-19 years, this fatality rate of 0.53 per cent, however, was 3 times as high as that for the same ages in the state as a whole. The fatality rate at all ages in 1923 was 7 times as high for the institutions as for the state.

In its prophylactic properties the use of the serum was decidedly disappointing. Among institution children at least the serum seems reliable only where

given within 6 days to children who have been exposed to small doses of infection for only a short time. If given during the incubation period it will probably have a favorable influence on the mortality, but under exceptionally adverse conditions it is inadequate. In 1923 the fatality rate for children under 3 was almost twice as high for untreated children as for those given serum (74 cases with 9 deaths as against 65 cases with 4 deaths). On the whole, however, the figures for the combined years 1923 and 1924 for children under 3 are slightly in favor of the cases not treated with serum. This is probably partly due to the small number of cases under consideration and to the decidedly unfavorable circumstances in which, in 2 of the outbreaks, the serum was used.—Edward S. Godfrey, Jr. *J. Prev. Med.* 2:11-33 (Jan.), 1928.

Vital Statistics in Iowa, 1927—Provisional figures for 1927 show a slight but encouraging decrease in the death rate in Iowa. The total number of deaths was 24,237 as compared with 25,466 the year before, and 24,619 as the average for the 5-year period from 1923 to 1927 inclusive. Heart disease again heads the list of causes of death; 4,846 persons died of heart disease in 1927 as compared with 3,970 for 1926 and 3,299 as the average for the 5-year period. Cancer caused 2,646 deaths in 1927 and 2,593 in 1926.

Cerebral hemorrhage, third highest cause of death; pneumonia, fourth; nephritis, fifth; tuberculosis, sixth, and influenza, seventh, all show a commendable decrease as compared with 1926. There were only two diseases in which there was a significant increase in the death rate. These were measles, which caused 210 deaths, and poliomyelitis (infantile paralysis) which caused the death of 29.—Iowa State Dept. of Health. *Weekly Health Message*, Feb. 25, 1928, p. 2.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C.E.

GREAT LAKES DRAINAGE BASIN AGREEMENT

LEWIS S. FINCH

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AN agreement providing for interstate cooperation in handling stream pollution problems, occurring within the Great Lakes Drainage Basin, was drafted March 7, 1928, at Gary, Ind., by the State Health Commissioners, or their representatives, of Minnesota, Wisconsin, Illinois, Indiana, Michigan, and Ohio. The State Health Departments of Pennsylvania and New York were not represented at this meeting, but their executive officers had previously expressed their willingness to become parties to such an agreement.

This agreement, which is to be officially known as the "Great Lakes Drainage Basin Sanitation Agreement," follows the general lines of the interstate agreement of the Ohio River Drainage Basin which has now been in effect for four years.

The purpose of the Great Lakes compact is defined in the following resolution:

WHEREAS the Great Lakes (Superior, Michigan, Huron, St. Clair, Erie and Ontario) are used as the only available sources of public water supplies by many municipalities in Minnesota, Wisconsin, Illinois, Indiana, Michigan, Ohio, Pennsylvania and New York, and such use must of necessity increase with the future increase of population; and

WHEREAS the protection and promotion of the public health demand that the water of these lakes and their tributary streams shall be suitable to permit the production of safe, wholesome, and palatable water supplies, after reasonable purification; and

WHEREAS sewage and industrial wastes are now discharged to the said lakes and many of their tributaries to an extent affecting the safety, wholesomeness, or palatability of water supplies obtained therefrom; and future increase in the pollution of these lakes and their tributaries will occur unless suitable corrective and preventive measures are applied; and

WHEREAS the said lakes and many of their tributary streams are interstate lakes and streams common to the States of Minnesota, Wisconsin, Illinois, Indiana, Michigan, Ohio, Pennsylvania, and New York, and pollution thereof originating in one state does or may prejudicially affect public water supplies, public health, or public interest in a neighboring state or states, thus creating a problem of common interest, and requiring cooperation between the several states; therefore be it

RESOLVED that the Departments of Health of the States of Minnesota, Wisconsin, Illinois, Indiana, Michigan, Ohio, Pennsylvania and New York, represented by the executive officers of the said Departments of Health, do hereby agree to cooperate with each other and with the United States Public Health Service in carrying out a policy for the improvement of the quality of the waters of these interstate lakes and their tributary streams wherever necessary in these states, the prevention or correction of undue pollution thereof, to the end that the said lakes and tributary streams may be maintained or rendered suitable sources of public water supplies as aforesaid.

At the Gary meeting, Dr. Wm. F. King, State Health Commissioner of Indiana, was elected chairman and Dr. I. D. Rawlings, Director of the Illinois Department of Public Health, secretary.

The resolution, as drafted at Gary, has now been submitted to the executive boards of the various state health departments for ratification.

After this action has been taken by these boards, it is expected that the state health commissioners will again meet, and among other things, authorize the formation of a board of engineers, composed of the chief engineers of the several departments of health.

This board will be charged with carrying out the spirit of the agreement which essentially is that each state health department, agrees to exercise "conscience" in dealing with the matter of stream pollution as affecting other states.

Malaria in Haiti—This brief article is a very clear picture of the high points of malaria in Haiti, and a good description of the island in relation to mosquito production. Haiti has only one efficient vector of malaria, *A. albimanus*. This anophelese is capable of transmitting all three types of malaria. The authors give their reasons for believing that malaria was imported into Haiti and is not of native origin.

The island is small, having but 10,200 square miles; less in area than the State of Maryland, yet it has all kinds of climate—from tropical on the coast to temperate in the hills. The most important plateau is a large central plain approximately 1200 square miles in area. Parts of the island are desert-like in their dryness; other portions are exceptionally wet. Late summer and winter are the malarial seasons. *Albimanus* breeds all over the island wherever water collects and has been found up to 2500 feet above sea level. Rainfall varies in different parts of the island from a minimum average of 21.7 inches annually (portion of the island where the runoff dries quickly, non-malarious) to 167 inches in the most malarial part.

Malaria is very prevalent and severe.

Splenic index in a large number of school children shows rates varying from a minimum of around 2 per cent to a maximum of 100 per cent. Many schools show rates between 20 per cent and 60 per cent.

The problem of control differs in type in the rural and urban centers. It is the authors' belief that rural districts must at present depend solely upon adequate quinine treatment of those sick. Many of the cities practice mosquito control, and it is advised that the rest of them initiate its practice.

A. albimanus quickly begins breeding in new swampy places formed by heavy rains, thus differing from our *quadrimaculatus*. The malaria infection very closely follows the rainfall, lagging behind about two months.

Control work at Port au Prince is described in a general outline. It was an extensive piece of work. *Albimanus* was breeding in many of the street ditches, in seepage areas, and the nearby extensive swamps. For the ditch breeding and the seepage, the attack was drainage and fill. Rock drains (earth covered) were used extensively with success. Much of the swamp land was dried by complete clearing of brush and opening it up to process of evaporation. Some of the swamps were drained, and low portions were filled. Apparently the major portion of the work has now been completed, but there is yet some which remains to be done. The tables giving malaria infection by months for a number of years show a steady decline in the case rates from a January rate (1924) of 1350 per 1,000 to the January rate (1926) of only 125 per 1,000—C. S. Butler and E. Peterson. *U. S. Nav. Med. Bull.*, 25:278 (Apr.), 1927. Abstr. L. L. Williams, Jr.

An Experiment in Mosquito-Proofing Barracks of British Troops—The article covers experimental screening of certain barracks at Lahore

and Amritsar, plains stations in the Lahore Military District, India. These two stations are located in the flat country having poor drainage, and are the most malarious of all Indian stations.

Anti-larval work has been carried on for many years as has personal protection by the use of mosquito nets, mosquito lotions, fumigations, etc. Not all of the barracks at these two stations were screened. Barracks screened were long, single story, bungalow type, having a 12' wide verandah on one side. These verandahs were pierced by a series of archways, the only openings to the verandah. A stout wooden framework was made in each archway and covered with brass wire gauze, 16 mesh, over which one-half inch rabbit netting was nailed for protection. Doorways were double screened with a 10 foot screen gangway between the doors. Doors opened outward and were fitted with double springs. Windows were screened on the outside. Fire places were temporarily filled with brick during the warm weather and all ventilators covered with wire gauze. One man per barrack room was detailed for the sole duty of keeping screens in good repair. It was made a court martial offense to prop a screen door open or to pass a door so propped without removing the obstacle.

In addition to malaria prevention, other advantages were the dispensing with mosquito nets which allowed the lowering of punkhas, the absence of flies and non-biting insects as well as pest mosquitoes and the actual lowering of the temperature in the rooms.

Malaria was as prevalent in the unscreened buildings at these two barracks in 1926 as in any other preceding year. During 1926 the malaria rate in the screened barracks in Amritsar was one-fourth the average rate for the three preceding years and at Lahore one-fifth. At Lahore the rate was less than one-third in the unscreened barracks.

The writer concludes that the screen-

ing of barracks properly carried out is a means of reducing malaria among troops, but cannot be considered as a sole antimalaria measure, its efficacy being more or less in inverse ratio to the evening attractions outside the barracks.—A. Campbell Munro. *J. Roy. Army Med. Corps*, 49:248 (Oct.), 1927. Abstr. R. E. Tarbett.

The Aluminate-Alum Coagulation of Water—Alum has been used almost universally as a coagulant in water purification, but its use with certain waters, or under certain conditions has not been satisfactory. In some waters in the Great Lakes region, 0.2 to 0.4 gr. per gallon is an efficient dose, but some plants in other sections require as much as 5 or 6 gr. per gallon. Studies of these phenomena have shown that colloidal waters do not yield readily to treatment by alum. The application of hydrogen ion control resulted in great advances, but the principles of colloid chemistry, it is felt, will yield still further advances.

Many workers have sought a coagulant that would meet the conditions required by their water supply, and also yield an effluent of sufficient alkalinity to be non-corrosive. Sodium aluminate therefore came into use, but was not entirely satisfactory, until a certain type of the chemical, possessing in itself colloidal properties, was used. Further research is now going on. An account of the results at several plants is given.—C. H. Christman. *Bulletin 18-A*, issued by Chicago Chem. Co. Abstr. W. A. Hardenbergh.

Disposal of Drainage from Coal Mines—Coal mine drainage waters contain sulphuric acid in such quantities that the alkalinity of 80 to 100 gallons of fresh water is necessary to neutralize the acidity of 1 gallon of waste. Coal is produced in 28 states at a rate of 550,000,000 tons annually, and the

industry employs 850,000 men. The pollution is most acute in West Virginia, Pennsylvania and Ohio. Many water supplies in Pennsylvania have been abandoned due to mine drainage pollution. The Sanderson case dating back to 1886 is summarized. In this case the courts held that trifling inconvenience to individual riparian owners must give way to a leading industrial interest of the state.

The Indian Creek pollution suit is also summarized. In this case, a water company serving 75,000 people and the Pennsylvania Railroad obtained an injunction, which was sustained by the U. S. Supreme Court, prohibiting the discharge of mine drainage into Indian Creek above the diversion of its waters, on the ground of public nuisance being created. In this case a public use of the water was shown and no other supply was available.

The character and composition of various mine drainage waters are given and analyses are shown in tables. The occurrence of water in mines is described. Methods of treatment and costs are given. The cost to neutralize (but not redeem) streams in Pennsylvania alone is estimated at \$75,000,000 for plants and \$41,062,500 to \$68,437,500 annually for operation.

The author suggests that any solution must be economically sound and commends the policy of the Pennsylvania Department of Health which is to protect all unpolluted streams; to stop further pollution of all streams that can be restored; and to use those now destroyed for carrying sewage, industrial wastes and mine drainage.—Andrew B. Crichton. *Water Works*, 66:30 (Jan.), 1927. Abstr. E. A. Reinke.

The Treatment of Sewage by Activated Sludge—The author, after a survey of the literature, concludes that the activated sludge process is of bacterial origin. The quantity of activated

sludge must be proportioned to the consumption of the organic matter of the liquid, to the nature of these, to aeration, to the condition of the sludge, and to temperature.

It is necessary to aerate sufficiently to maintain the best bacterial flora, and to proportion the aeration to the activity of the bacteria, to the quantity of organic material to be acted upon and to the quantity of sludge in order not to pass the moment when the sludge itself is altered and commences to putrefy. The sludge should be settled well and should retain but little of the suspended solids.—*Annales d'Hygiene Publique, Industrielle et Sociale*, T. IV, n° 12, Decembre 1926. p. 732. Abstr. R. C. Beckett.

Use of Hypochlorites as a Sterilizing Agent for Dairy Utensils—Since disinfectants containing hypochlorites have been used for the sterilization of dairy utensils, and it has been claimed that such disinfectants are more effective than steam sterilization, this question was studied in the interests of the milk industry. Three proprietary disinfectants were studied. These contained "available chlorine" as follows: A—1.22 per cent; B—1.06 per cent; C—0.45 per cent.

Four series of experiments were conducted upon milk churns of 10 and 17 gallons capacity and the influence of different methods of treatment of the churns upon the keeping qualities of milk and upon the bacteriological condition of the churns studied. The technic used in performing the experiments is given and the results are tabulated in the form of protocols.

The authors give their conclusions as follows: (1) The amount of "available chlorine" contained in these disinfectants varied from 1.23 per cent in disinfectant A to 0.49 per cent in disinfectant C; (2) a 6 per cent solution of disinfectant A failed to give the same

degree of sterility in a churn as can be obtained by steam under working conditions; (3) the use of a chlorine preparation as a means of sterilizing churns necessitates the subsequent washing out of the churns with water if the chlorine is to be removed before milk is added. This process introduces the danger of recontamination of the churn; (4) if the churn be not washed out after treatment with a chlorine preparation, there is grave danger that chlorine will be added to the milk. That this danger is not altogether hypothetical would appear to be the case since in the United States where this method of sterilization is more extensively used than in this country, the Department of Agriculture has issued a bulletin describing a method for the detection of hypochlorites and chloramines in milk and cream. (U. S. Department of Agriculture *Bulletin No. 1114*, Aug., 1922).—W. A. Hoy and Janet R. L. Rennie. *J. Hyg.* 26:127 (July), 1927. Abstr. P. R. Carter.

Sewage Farm Covers 13,602 Acres
—An abstract of an article in *The Engineer* (London) November 12, 1926, p. 519, describes the method of sewage disposal of Melbourne metropolitan area (Victoria, Australia). The land was "originally treeless, almost stoneless, open plain country somewhat clayey and poorly grassed," having an average annual rainfall of 18.14 inches.

The farm is sown with lucerne, pasture grasses and clover and flooded with sewage and used for raising hay and for grazing. Except in winter or very wet weather, the farm takes 3 inches of sewage every 2 or 3 weeks or 5½ feet per year; 8,084 acres being

under irrigation. Dairying is not permitted, but grazing and raising cattle and sheep are carried on. On June 30, 1925, there were 6,671 cattle, 4,947 sheep, and 800 horses with 200 employes on the farm. Revenue from grazing usually is greater than cost of sewage treatment aside from capital charges, while in years of drought revenue meets all charges.—*Eng. News-Rec.*, 99:669 (Oct. 27), 1927. Abstr. A. S. Bedell.

Preliminary Report on a Rat and Flea Survey of the City of San Juan, Porto Rico—While rat extermination has been practiced at San Juan following two epidemics of plague, no real study of fleas infesting the rats was made until recently when such a project was undertaken in coöperation with the U. S. Public Health Service.

The town was divided into four zones: (1) docks; (2) water front adjacent to docks; (3) commercial districts not on water front; (4) remaining portions. Traps were set daily in each zone and all live rats were taken to the laboratory for examination. Classification and counts of rats and the infesting fleas were made.

Concentration of the species of rats was higher along the water front and from data already collected it appears that the species "*mus rattus*" was the favorite host for fleas. The per cent of rats infested with fleas when plotted graphically follows very closely the corresponding curves for temperature and relative humidity, suggesting a relationship.—Arturo L. Carrion. *Porto Rico Rev. Pub. Health and Trop. Med.* 3:131 (Oct.), 1927. Abstr. D. W. Evans.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M.D., AND LEONARD GREENBURG, PH. D.

Budapest Congress Progress Report—The Fifth International Medical Congress for Industrial Accidents and Occupational Diseases is definitely announced to be held in Budapest, Hungary, September 2-8, 1928. National committees have been formed in the principal countries.

Since the first American announcement of December 1, 1927, Dr. Fred H. Albee, New York, and Dr. Emery R. Hayhurst, Ohio State University, Columbus, both members of the Permanent International Committee, have been appointed Joint Chairmen of the National Committee for the United States, and have appointed Dr. Richard Kovacs, New York, as Secretary.

The Travel Study Club of American Physicians, of which Dr. Fred H. Albee is President and Dr. Richard Kovacs, Secretary, has rearranged its summer trip for 1928 especially to focus upon the Budapest Congress. Those who have already indicated their intention of attending the Congress and others are invited to join the Travel Study Club either for the entire trip or at any point.

The itinerary thus far arranged calls for sailing from New York on the S.S. Munchen, of the North German Lloyd, on August 16; three days in Berlin, two days in Carlsbad, five days in Budapest, two days in Vienna, two days in Bad Reichenhall and Salzburg, and two days in Munich; then via Milan to Nice for two days and from September 17 to 27 in Spain; sailing from Gibraltar on September 28 on the S.S. Conte Grande, of the Italian Mediterranean Service, due back in New York on October 5.

Correspondence regarding the trip should be had with Dr. Richard Kovacs, 223 E. 68th St., New York, N. Y.

National Delegates to Budapest Congress—Certificates of delegation have been issued over the signature of Frank B. Kellogg, U. S. Department of State, to represent the United States at the Fifth International Medical Congress of Industrial Accidents and Occupational Diseases, to be held at Budapest, Hungary, to the following persons: Dr. Fred H. Albee, New York, N. Y.; Dr. Francis Dennis Donoghue, Boston, Mass.; Dr. Emery R. Hayhurst, Columbus, O.; Dr. Francis D. Patterson, Philadelphia, Pa.; Passed Assist. Surgeon O. M. Spencer, U. S. Public Health Service.

Fourth International Conference of the Permanent Committee on Occupational Diseases—According to a circular received February 15, 1928, this Conference is to be held at Lyon, France, April 3-6, 1929. The Organization Committee consists of: Dr. Agasse-La Font, Dr. Kohn-Abrest (Paris), and Professeur Etienne Martin (Lyon). The officers of the Conference are: President, Professeur Etienne Martin; Secrétaire, Dr. Mazel; and Trésorerie, Imprimerie A. Rey.

The particular items for discussion will be: silicosis, including etiology, symptoms, and legislation (Professor E. L. Collis of Cardiff, will be one of the respondents); pneumoconiosis, author yet unnamed; cataract of occupational origin, particularly with reference to etiology and symptoms (Professor Rollet of Lyon will be one

of the respondents); and the endocrine system in relation to intoxications (Professor L. Ferrannini of Cagliari will be one of the respondents). Names of others who would like to read papers upon the above listed subjects should be sent either to the Secretary Dr. Mazel 54, Avenue de Noailles, Lyon, or to one of the members of the Permanent Committee in the United States, viz., Dr. Alice Hamilton, School of Public Health, Harvard University, Boston, Mass., Dr. Cecil K. Drinker, same address, or Dr. Emery R. Hayhurst, College of Medicine, Ohio State University, Columbus, O.

Circulars of information are to appear from time to time and all interested will get in touch with either Dr. Mazel or one of the members of the American Committee.

Infective Jaundice Among Scotch Coal Miners—The British Medical Research Council recently reported 17 cases with 5 deaths of infective jaundice among Scotch miners since 1923, and in all Scotland they report 31 cases with 8 deaths, giving a mortality of 25 per cent.

These cases occurred in mines that were wet and infested with rats. Similar cases have occurred in all parts of the world and especially during the late war among soldiers in the trenches. The spirochetal origin was demonstrated in Japan in 1915. In 1916, an anti-spirochetal serum was developed which was and is quite effective in treating this disease.

Examination of rats in the infested areas showed 36 per cent infected. At autopsy, 6 cases presented an intense yellow color, effusive hemorrhages, and kidney degeneration. The liver showed degeneration to a lesser degree.

Experimental infection of guinea pigs leads to the belief that infection occurred through the skin and contaminated hands rather than through ingestion.

Eliminative measures suggested are immunization, lime nitrogen on the soil, extermination of rats and drainage of mines. — *Mon. Labor Rev.*, 26:54 (Mar.) 1928.

Asthma Caused by Castor Beans—This report, by Karl D. Figley, M. D., and Robert H. Elrod, M.D., is in January 14 issue of the *Journal of the American Medical Association*. The existence of an "asthma colony" in a certain section of the city of Toledo, O., has been known to physicians for some years. A mill in the vicinity manufacturing both linseed and castor oil, while suspected, had not previously been shown to have any relationship.

The castor bean cake after the oil has been extracted is ground and used as fertilizer. In the process of grinding very fine dust is given off which is carried out through pipes in the roof. The flaxseed, after the extraction of the oil, was still found to contain about 9 per cent of oil and was too heavy for the wind to carry far.

While the odor of linseed oil was quite marked, sensitization tests for castor bean dust and flaxseed dust showed that all those examined reacted to castor bean, and only five to flaxseed, and these in a lesser degree.

In view of the fact that the cause seems so well established, the mill was ordered to take steps to prevent the dissemination of the dust.—*Month. Labor Rev.*, 26:52 (Mar.), 1928.

Quantitative Measurements of the Inhalation, Retention, and Exhalation of Dusts and Fumes by Man: I. Concentrations of 50 to 450 mg. per cubic meter—The purpose of this study was to determine quantitatively the retention of certain representative dusts and fumes by the lungs of persons forced to respire them.

Zinc oxide of a particle size of 0.4 microns, Kadox, which is zinc oxide

having a particle size of 0.15 microns, and marble dust, having a particle size of 0.3 to 6.0 microns were utilized as the representative dusts. These dusts respectively were set up in a 1,600 cu. ft. gas cabinet. The subjects were seated outside of the cabinet and derived their supply of air containing the dust from the cabinet. The quantity of dust which was exhaled was determined by means of an electric precipitator, while the volume of air was found by the use of a spirometer. Concentrations of dust from 50 to 450 mg. per cubic meter were used with exposures of from 5 to 40 minutes and with respirations from 6 to 18 per minute. Under these conditions the percentage retention for all three dusts averaged 55 with a standard deviation of 9.4. This study appears to be a very excellent and accurate piece of work.—P. Drinker, R. M. Thomson, and J. L. Finn, *J. Indust. Hyg.*, 10, 1:13-25 (Jan.), 1928.

L. G.

Changes in the Blood as Reflecting Industrial Damage—The author has reviewed the literature and her own industrial experience with reference to the blood changes on exposure to benzol, toluol, xylol, naphthalene, aromatic nitro compounds, arsine, thallium, and hydrocyanic acids. She finds that a lymphocytosis with the reversal of the leucocyte formula to the lymphocytic side with repression of the neutrophils takes place with the utmost regularity regardless of the particular poison which is acting. This similarity of effect of the various compounds causes the author to look for a common site of action, and leads her to the conjecture that action on the endocrine glands may be taking place since "as a result of functional disturbances of the endocrine glands we have this reversal of the blood formula." Such a hypothesis requires the existence of other signs of endocrine disturb-

ances. These have been suggested by Schmidt in the case of pernicious anemia. "If one admits that a relation between endocrine glands and diseases of the blood is at least conceivable, then it becomes possible to consider damage to the endocrine glands as a means of causation of changes in the blood due to industrial conditions."—Selma Meyer, *J. Indust. Hyg.*, 10, 2:29-55 (Feb.), 1928.
L. G.

Metal Fume Fever: V. Results of the Inhalation by Animals of Zinc and Magnesium Oxide Fumes—The purpose of these experiments was to determine if it was possible to produce a characteristic reaction due to the inhalation of freshly generated zinc oxide in animals, and also to determine whether such a reaction could also be caused by magnesium oxide fume. The authors of this paper have previously shown that it was possible to produce such symptoms in man by the inhalation of zinc oxide.

Accordingly, 25 animals of different species (cats, rabbits and rats) were exposed to freshly generated zinc oxide in an atmosphere of air plus 10 per cent carbon dioxide (in order to increase the depth of respiration) for a period of from 15 minutes to 3¼ hours, and 6 cats were exposed to an atmosphere of freshly generated magnesium oxide.

These experiments disclosed the fact that in the case of zinc oxide the animals displayed a fall in body temperature of slight and fairly transient character following brief exposure, but of marked character and prolonged duration in those animals inhaling the fumes for 1 hour or more. In the case of magnesium oxide a similar but milder reaction was found to result.

The experiments also showed that the amount of zinc inhaled is proportionately much greater during the first part of the exposure and appears to fall off in rate during the later portions of

exposure; and that inhaled zinc oxide is rapidly removed from the lungs of exposed animals, the concentration in the lung decreasing and the concentration in the liver, gall bladder, bile, kidney and pancreas increasing with time.—K. R. Drinker and P. Drinker, *J. Indust. Hyg.*, 10, 2:56-70 (Feb.), 1928.

L. G.

Chronic Benzol Poisoning Among Women Industrial Workers: A study of the women exposed to benzol fumes in six factories—The author studied the incidence of chronic benzol poisoning among women exposed to the inhalation of this substance in six factories in the State of New York. Complete histories and clinical studies were made on each worker. The criterion of benzol poisoning adopted by Dr. Smith was a history of exposure and a reduction of 25 per cent or more in the white blood cell count. One out of every three women exposed was found to be chronically poisoned by benzol. The susceptibility appeared to be equal among the older and younger workers. There also appears to be a tendency toward a slight increase in the number of basophils as well as an increase in endotheliocytes and the presence of myelocytes.—A. R. Smith, *J. Indust. Hyg.*, 10, 3:73-93 (Mar.), 1928.

L. G.

Efficient Exhaust Systems for Lead Melting Pots in Electrotyping Plants—Sheet metal hoods generally in use for lead melting pots are not so efficient as desired, as they do not afford complete protection for workers standing constantly over the pot, since the fumes must pass the face of the worker in getting to the hood. Lateral suction is recommended in these cases. The apparatus consists of a plate and hood at one end of the pot, the same width as the pot, leading to a pipe and exhaust fan above. The size of the equipment de-

pends upon the size of the pot. This arrangement is much more effective than the old. (Diagram accompanies article.)—John F. Grant, Inspector, *Ind. Hyg. Bul.* N. Y. State Dept of Labor, Dec., 1927.

Apparatus for Artificial Respiration: The Barospirator of Professor T. Thunberg—Probably one of the oldest methods for resuscitation is that of mouth to mouth insufflation. Then followed the mechanical method of blowing air into the lungs and sucking it out for expiration. The manual methods of Silvester and Schafer utilize no apparatus, but simply pressure on certain portions of the body in an effort to perform air exchange in the lungs. The HENDERSON-HALDANE apparatus attempts to stimulate respiration by the stimulatory effect of carbon dioxide on the respiratory center.

The barospirator of Dr. Thunberg consists of an air tight apparatus in which the patient is placed, connected to a large cylinder in which, by the movements of a piston, the pressure is alternately increased and decreased. By this means pressure changes are caused to take place in the lungs, thereby stimulating normal respiration. "The situation is different from that presented by other methods of artificial respiration in that ventilation is attained without volume changes in the pulmonary air spaces."

The majority of persons placed in the barospirator soon lose respiratory movements as the setting of the instrument reaches the proper point. There are no subjective symptoms other than those noticed from the ears. The author concludes that this system offers no danger to the patient, and that an instrument of this type with its undoubtedly high efficiency is bound to find hospital use in due time.—Cecil K. Drinker, *J. Indust. Hyg.* X, 1:7 (Jan.), 1928. L. G.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

On the Existence of Two Active Factors in the Vitamin B Complex II—Literature is quoted to show that vitamin B is of complex nature containing at least two active substances, one which prevents the onset of experimental beriberi but is not capable of inducing growth when it is the sole addition to a vitamin B-free diet; the other is impotent as a beriberi prophylactic and is also in itself inactive as a growth accelerator but is an essential accessory of the beriberi preventing factor in supporting growth. The former is identical or associated with the pellagra preventing (P-P) substance of Goldberger. The beriberi preventing substance is termed B-P. Both factors were adsorbed by fullers' earth, B-P under certain conditions more than P-P. A combination of treatments with small amounts of fullers' earth, of fractionation with alcohol and of heating, furnished a preparation from an extract of velvet bean leaves, that retained marked properties of preventing pellagra-like symptoms and also of accelerating growth when fortified with sufficient B-P. The treated preparation alone did not produce any growth and did not prolong the life of rats beyond the average on the basal diet alone. A relation between the amount of B-P factor available and the rate of growth was found to exist. The concentration of the B-P factor in a sample of dried kudzu leaves was too low to permit of a complete utilization of the P-P factor.—W. D. Salmon, N. B. Guerrant, and I. M. Hays, *J. Biol. Chem.* 76:487 (Jan.), 1928.

A Study of the Nitrogen Minimum. The Effect of Sixty-three Days of a Protein-free Diet on the Nitrogen

Partition Products in the Urine and on the Heat Production—The constant protein intake of a normal man was made so small as to be negligible by a protein-free diet and when the urinary N excretion was reduced to the so-called N minimum thyroxin (7 mg. intravenous) was administered. The diet was largely sugar (usually sucrose) and cornstarch (1800 calories) with sources of vitamins, roughage (lettuce) and mineral salts. The minimal excretion of total N during a 30-day period before thyroxin administration was 2.10 gm. in 24 hours. In a second 11-day period on this diet following thyroxin the N excretion was lowered to 1.79 and 1.75 gm. on the last two days. The value 1.75 gm. represents 0.0241 gm. per kilo. No noticeable deleterious effect followed the loss in the urine of 259 gm. of deposit protein N which totaled probably 291 gm. of N if amount probably lost in feces be added. The quantity of reserve or deposit protein is much larger than generally believed. The excretion of small quantities of N is not necessarily indicative of a great reduction in the quantity of deposit protein at least in the sense that the body cannot continue to maintain itself for a further period on a N-free diet. The output of creatinine and uric acid as well as neutral sulphur and ethereal sulfate remained extremely constant. The fluctuation in total N was almost entirely due to variations in the amount of urine excreted. The true endogenous metabolism in case of a normal adult man is slightly less than 1 gm. daily. There was a rapid fall in the basal metabolic rate during the first eight days of protein-free diet which occurred coincident with the rapid decrease in the free utilization

of the deposit protein. It remained practically constant when N excretion fell to lower levels and was definitely elevated above normal when the subject was on a high protein diet replenishing his stores of deposit protein. No noticeable physiologic disturbances resulted from the prolonged ingestion of protein-free food other than nausea due to monotony of the food toward the end.—Harry J. Deuel, Jr., Irene Sandiford, Kathleen Sandiford, and Walter M. Boothby, *J. Biol. Chem.* 76:391 (Jan.), 1928.

The Effect of Thyroxin on the Respiratory and Nitrogen Metabolism of a Normal Subject Following Prolonged Nitrogen-free Diet—A reduction of the deposit protein equivalent to 149 gm. of nitrogen by a preliminary period of 30 days on a non-protein diet did not in any way alter the characteristic effect of thyroxin on the nitrogenous or respiratory metabolism.—Harry J. Deuel, Jr., Irene Sandiford, Kathleen Sandiford, and Walter M. Boothby, *J. Biol. Chem.* 76:407 (Jan.), 1928.

Yellow Cocci in Dairy Products Which Survive Pasteurization—In investigations of various dairy products it was observed that yellow colonies of cocci were frequently encountered. These colonies seemed especially numerous on plates from pasteurized products. In the studies of these organisms the resistance to heat, the variations that occur and the general action on milk were given the most attention. Experimental data show that these organisms can resist the usual pasteurization exposures and that the same general resistance to heat was encountered in different materials. Based on cultural studies the authors have suggested a division of these bacteria into three types—A, B and C. A consideration of the various classifications studied suggests that Type A should be considered

Sarcina lutea, Type B as *M. varians*, and Type C as *M. luteus*. The authors further conclude that these organisms were less resistant in milk containing acid sufficient to cause coagulation than in normal milk. They produce changes in milk only slowly and accordingly are probably of little practical importance in the deterioration of dairy products.—B. W. Hammer and G. Malcolm Trout, *J. Dairy Sci.* 11:18 (Jan.), 1928.

Experimental Bone Marrow Reactions. IV. The Influence of Liver and Meat Diets on the Bone Marrow and the Regeneration of Red Blood Cells and Hemoglobin—An experiment was conducted to determine the effect of liver and meat feeding on the blood regeneration of pigeons which were made anemic by starvation. The pigeons were starved from 7 to 13 days after which they were fed: (1) mixed grain diet obtained in the market and used as stock pigeon feed; (2) broiled beef liver, medium done to rare, cut in small pieces by hand to avoid loss of juices; (3) broiled beef muscle treated as liver. The weight of pigeons fed on the grain diet was regained in from 11 to 24 days while beef liver caused a rapid regeneration of red blood cells and hemoglobin up to the 12th day when they began to steadily decline. Beef meat was as effective and in many instances more effective than the grain diet. It was found that mixed grain diet and beef muscle showed essentially the same features with regard to replacement of weight and regeneration of red blood cells and hemoglobin. The bone marrow showed an abundance of erythrocyte formation and a great many megaloblasts. The bone marrows of the liver fed animals up to the 12th day were practically the same as those of the grain and meat fed pigeons. The cholesterol in the serum of the liver fed birds was increased to five times its normal value. The hypothesis is considered that the suppression of red blood

cell and hemoglobin formation is due to the excess of some inhibitory substance in the liver and not to a lack of substances, and it is suggested that the factor of inhibition or suppression of blood formation may be the beneficial factor in the liver diet treatment in pernicious anemia.—Gulli Lindh Muller, *Am. J. Physiol.* 82:269 (Oct.), 1927.

The Effect of Variations in the Proportions of Calcium, Magnesium and Phosphorus Contained in the Diet—It was deemed of considerable importance to determine whether variations in the intake of mineral salts are capable of disturbing the physiological balance among the mineral ions in the tissues to such an extent as to affect the normal functioning of the animal body. Experiments dealt primarily with the effect on rats of variation in the proportions of Ca, Mg and P contained in rations intended to be reasonably adequate in other respects. The general trend of the results obtained leaves no doubt concerning the correctness of the belief that a more or less balanced condition of Ca, Mg and P salts of the ration is essential to normal growth and functioning. High Mg as a disturbing factor in nutrition is definitely indicated by the data on growth and mineral balance, the extent of this disturbance being conditioned by the intake of Ca, P, and vitamins (or their carriers). The response of various groups of animals to certain vitamin levels points to even more important vitamin-mineral interrelationships than have heretofore been recognized.—J. R. Haag and L. S. Palmer, *J. Biol. Chem.* 76:367 (Jan.), 1928.

Vitamin Synthesis in Plants as Affected by Light Source—Biological studies were conducted for vitamins A, B and C in seeds of wheat and yellow milo maize germinated in the dark, in sunlight, and under glass of various

colors, as well as under the mazda, arc, and ultra-violet lamps. The amounts of vitamin A found in seedlings seems to be a factor depending upon the light rather than upon changes taking place in the process of germination. Some increase is always found in etiolated seedlings. The quantity of vitamin A synthesized is dependent upon the intensity of illumination, length of exposure, and evidently the relative amount of shorter wave-lengths, and follows closely the rate of growth of the plant. Vitamin B is evidently not increased in the germination and early growth of the seedlings, its formation coming at a later period of development of the plant. Vitamin C is formed more rapidly than either of the other vitamins studied. There is evidence that germination alone even in the dark, produces a considerable amount of vitamin C. It increases in light-grown seedlings to an extent that is greater than can be accounted for on the basis of the increased growth of the seedlings, and its production is evidently accelerated like vitamin A, by increased intensity of light. Evidence is furnished that plants grown in the open sunlight under intense illumination should be slightly superior sources of vitamin.—V. G. Heller, *J. Biol. Chem.* 76:499 (Jan.), 1928.

Growth Upon Diets Practically Devoid of Arginine With Some Observations Upon the Relation of Glutamic and Aspartic Acids to Nutrition—The relation of arginine to maintenance and growth has been the subject of several investigations none of which has yielded convincing results. The chemical similarity of ornithine and glutamine, the latter probably being the form in which glutamic acid occurs in proteins, is very striking and suggestive. If the animal organism possesses the ability to reduce the acid amide group of glutamine to the methylene amine group of ornithine, a synthetic origin

of arginine might be readily accounted for. White rats were fed three diets; two contained hydrolyzed casein, were practically devoid of arginine, and low in glutamic, hydroxyglutamic and aspartic acids and in the third the nitrogenous element consisted of hydrolyzed casein, containing the three dibasic acids, but had been treated for the removal of arginine. The results point strongly to the conclusion that arginine is not an essential component of the diet. This conclusion is largely possible because of the fact that arginine is probably removed completely as a salt of flavianic acid (2, 4-dinitro-1-naphthol-7-sulfonic acid). The sodium salt of flavianic acid is the coal-tar dye "Naphthol Yellow S." No definite conclusions are drawn on the importance of glutamic and aspartic acids.

Rapid growth can be secured upon diets not only practically devoid of arginine but also low in glutamic and aspartic acids. It is evident that the dibasic amino acids if they are necessary dietary components, the amounts required for growth are very small as compared with the quantities ordinarily present in a casein ration.—W. Edward Bunney with William C. Rose, *J. Biol. Chem.* 76:521 (Jan.), 1928.

Typhoid Fever Epidemic, Santa Ana, Calif.—Following a severe rain-storm December 27, 1923, there occurred an outbreak of a gastrointestinal malady in epidemic proportions. The onset was severe and acute. Out of a population of 27,000, approximately 10,000 were affected, disrupting the activities of the entire city. Many of the attacks were of short duration, lasting one or two days, while the others were more prolonged, ultimately terminating in typhoid fever. The laboratory findings during the first week of the epidemic indicated that the gastrointestinal disturbance in the cases examined were due to bacillary dysentery, a few para-

typhoid cases, and many cases of non-specific gastroenteritis infection. Suspicion was directed to the water supply, but it was not until one month later that final proof of the contamination of the drinking water was obtained. The results following failure to comply with recommendations to chlorinate the water supply and pasteurize the milk supply are quite obvious. In the period between January and April 1924, inclusive, there occurred 620 cases of typhoid fever, 226 of which were due to water supply pollution on December 27, 1923, and 143 to a second pollution on February 7, 1923. During the first week in March following the second pollution of the water supply, an outbreak of typhoid occurred in the city of Orange, five miles distant from Santa Ana, which was subsequently traced to consumption of milk supplied from a Santa Ana dairy. Two hundred cases resulted from the milk—43 in or near Orange, and 157 in Santa Ana—while 51 cases were due to contact. The milk was probably contaminated by a person infected with the polluted water. There was a total of 48 deaths—case fatality rate of 7.7; 28 deaths were among the water-infected patients, 17 among the milk-infected, 3 among contacts. Of 548 cases examined for release, 29 (5.29 per cent) continued to eliminate *B. typhosus* for more than one month. Nine of these were later released on two negative stool specimens. The remaining 20 (3.65 per cent) were carriers for more than 3 months; 11 continued to eliminate typhoid bacilli for more than 6 months. Persons of the age group 45-54 continued to eliminate typhoid bacilli for a longer period than any other age group. Of 916 food-handlers examined, 17 (1.85 per cent) were found to be carriers, 5 of whom gave a history of previous typhoid. One incubation carrier was found.—Charles H. Halliday and M. Dorothy Beck, *J. Prev. Med.* 2:49 (Jan.), 1928.

The Content of Vitamins A and C in Watercress—In determining vitamin A in watercress, rats weighing 45-55 gm. were given a vitamin D-free basal diet, consisting of caseinogen "vitamin free," rice starch, hardened bean seed oil, yeast extract, lemon juice and salt mixture. One litter of 6 rats, weighing 44-49 gm. were given a basal diet containing an ample supply of vitamin D. It was found that watercress is a remarkably rich source of vitamin A, 0.1 gm. only being necessary to promote normal growth. Its growth-promoting properties were found to be stronger in the spring and summer than in the winter. It was also found to contain small amounts of vitamin D. In determining vitamin C, guinea pigs, weighing 200-220 gm., were given a basal diet of ground oats, skimmed milk powder, butterfat and sodium chloride and in addition measured amounts of watercress shoots fresh daily. It was found that watercress is a very rich source of vitamin C, 1 gm. daily being enough to protect the animals for a period of 70 days.—Katharine H. Coward and P. Eggleton, *Lancet*, 1:97 (Jan. 14), 1928.

The Relative Content of the Fat-Soluble Vitamins A and D in a Series of Cod Liver Oils—In examining a series of cod liver oils in preparation of a report on the comparison between colorimetric and biological method in determining vitamin A, the oils were studied for their content of vitamin D to see whether any relationship existed between this and vitamin A present, in any one oil. Vitamin A was determined biologically on young rats. It is concluded that so great a variation in the individual rats precludes the determination of vitamin A with reasonable accuracy unless an inordinate number of rats are used. Tables are given

in which the oils are graded according to the growth increments on 6 and 19 mg. daily doses. Vitamin D was determined by three methods: (1) By increase in bone calcification after small doses for young rats on special diets; (2) by the determination of the lowered ash content in the bones of animals on a special diet "F" described; (3) by the increase in body weight. In spite of the difficulties in making accurate comparisons in biological methods, the authors conclude that the content of vitamin A in cod liver oil bears no relationship to that of vitamin D which is explained by the fact that A is less stable than D and more likely to be affected by heat and oxidation. It is pointed out that the medicinal value of cod liver oil depends more upon the antirachitic value than the content of vitamin A and since these vitamins bear no relationship, the biological method of testing cod liver oil outlined in the U. S. Pharmacopoeia is criticised.—Joan Leigh Clare and Katharine Marjorie Soames, *Lancet*, 1:150 (Jan. 21), 1928.

Is the Antirachitic Vitamin of Cod Liver Oil an Irradiated Ergosterol?

—In a brief note the author reports that fractional extraction of the unsaponifiable matter of cod liver oil with alcohol at varying H-ion concentrations yields products of different properties. The extracts at from pH 3 to 5 are pale yellow in color, while with increasing pH the color darkens. The acid extracts give a spectrum identical with that of irradiated ergosterol and are more strongly antirachitic than the alkaline extracts. Other similar properties are noted from which it is inferred that the vitamin is contained in the acid fraction of the unsaponifiable matter.—A. Adam, *Klin. Wchenschr.* 6, 27:1289. 1927. Abstr., *Exper. Sta. Rec.*, 58:90 (Jan.), 1928.

CHILD HYGIENE

MERRILL E. CHAMPION, M.D.

Maternal Mortality in Canada—Report of an Enquiry made by the Division of Child Welfare, Department of Health, Canada, at the request of the First Conference on Medical Services in Canada, held in Ottawa, December, 1924. *Publication No. 37*, Department of Health, Ottawa, 1928. 72 pp.

The information upon which this report is based was collected by means of questionnaires sent to physicians in the Provinces of Canada who signed death certificates of women in the year ended June 30, 1926. These questionnaires were sent in all cases where the recorded cause of death did not clearly eliminate conditions related to childbirth. A large proportion of the physicians concerned responded to the questionnaires, and these replies and the added comments are analyzed in the report, with quotations from many letters. The total number of deaths from causes connected with childbirth was found to be 1,532, a rate of 6.4 per 1,000 live births. The age of the mothers ranged from 15 to 48, the average age being 31. They left 5,073 motherless children, 768 of whom were newborn. In the letters from physicians and others who replied to the questionnaires lack of prenatal care was mentioned more often than any other one factor contributing to these deaths.

The report calls attention to the fact that there is no reason to believe that the number of maternal deaths in the year studied was any greater than in any other recent year, or than it will be in 1928 unless something is done to improve conditions. As remedies the report urges a greater appreciation of the seriousness of this matter on the part of both physicians and the general public, to be brought about by knowledge of the facts and an intelligent and determined effort to reduce the risks of maternity.

The Canadian Division of Child Welfare has issued two new "Little Blue Books" based on this report: *Publication No. 38, Mother—A Little Book for Women*, and *Publication No. 39, Mother—A Little Book for Men*. They explain in simple language the findings of the study and emphasize the importance of pre-

natal care and of proper care during and after childbirth.—

Child Welfare News Summary, Children's Bureau, U. S. Department of Labor, Washington, D. C., Apr. 7, 1928.

Diphtheria Deaths in Massachusetts—The authors comment on the fact that the former gradual drop in the fatality rate of diphtheria has not been apparent in recent years, but that there has been a spectacular drop in the incidence in the past few years. The relative incidence in the school group (6-14) has been decreasing, suggesting that the use of toxin-antitoxin in school clinics is playing an important part in the decrease of the disease.

None of the cases had ever been actively immunized against diphtheria. This is a strong point of immunization.

Two-thirds of the deaths occurred among those of "poor" economic circumstances; 5.5 per cent of the cases had no physician during their illness. The source of infection was known in 19.2 per cent of the cases.

In the "good" economic group, half of the cases had been seen 2 days after the onset, in the "fair" group, half of the cases had been seen 2½ days after the onset, and in the "poor" group, it was over 4 days after the onset before half of the cases had medical attention.

Medical consultation was had in 29 instances.

The foregoing figures indicate very strikingly one of the chief reasons for the continued mortality from this disease. While the too general delay in calling a physician for all manner of illness is well known and regrettable, it is, of course, especially disastrous in the case of diph-

theria where each day's delay in the administration of antitoxin may mean a preventable death. The fact that 68 per cent of the deaths were classed as among the "poor," further indicates the probable complicating factors of economic condition and ignorance.

In only 5 per cent of the cases did the physician fail to make a diagnosis of diphtheria. About half of the cases were of the pharyngeal type, another third laryngeal, while less than 1 per cent were nasal only. The others were combinations of these types. The most frequent complication was of the heart.

About two-thirds of the cases were hospitalized. The average dose of toxin-antitoxin was about 40,000 units.—F. C. Forsbeck & Edward A. Lane *New England J. Med.*, Mar. 1, 1928.

The Non-Tuberculous Child—

Non-tuberculous chest diseases require for therapy the identical three factors, rest, food and air, which are being recommended for tuberculous conditions. The present knowledge of these diseases has brought forth rest as the most effective treatment, not only in the case of the adult but also in that of the child. Food, adequate in kind and amount, with the proper eating habits is of secondary importance. A child at rest will partake of his food more heartily and willingly than one fatigued; hence, the close correlation between rest and diet. Air, which in the past has occupied the position of greatest emphasis, has now been shunted to third.

The fears of anxious mothers who suspect pulmonary tuberculosis in their children, because of certain conditions, have been found to be groundless in many cases. The disturbing symptoms reported by parents and which cause them to have the child examined are as follows: (1) underweight, with or without fatigue and listlessness; (2) persistent cough; (3) persistent low grade temperature slightly above normal; (4)

fever remaining after an attack of pneumonia; (5) positive Pirquet test or roentgen ray diagnosis; (6) exposure to open tuberculosis.

Before submitting a definite diagnosis of tuberculosis, each one of these possible symptoms presented should be minutely investigated with a question as to probable causes and significance. An underweight condition does not necessarily denote a tuberculous infection nor does normal weight exclude tuberculosis. Dr. Branneman feels that the greatest coöperation must be given when a child has been exposed to the disease itself.—Joseph Branneman, M. D., *J. A. M. A.*, 90:8 (Feb. 25), 1928.

Public Health Aspects of Heart Disease—In *The Public Health Nurse*, Hart discusses the various phases of cardiac disease from the point of view of the public health worker. He feels that the layman has now become so interested in the question that he wants to know what can be done about it.

Pointing out that mortality is not the only problem in heart disease, he calls attention to the high morbidity, the magnitude of which is known only to those coming into close contact with large numbers of cases. It is not the actual loss of life that constitutes the greatest drain on the community but the number of people, young and old, who are handicapped for life by the results of heart disease. Cohn is quoted as concluding that for every person dying of heart disease, there are 100 living with defective hearts, figures which on a national basis would give approximately 2,000,000 individuals with heart disease.

The causes of heart disease are summarized under three headings: (1) general infections such as diphtheria, rheumatism, syphilis; (2) certain poisons, such as lead; (3) degenerative diseases of middle and late life. Figures seem to show that more than half the cases are the results of infection and

Hart considers this a clue to the direction our preventive measures should follow.

Discussing prevention, the writer touches on the need of effective treatment for syphilis, the need of making use of every possible bit of information regarding the prevention of rheumatic fever, and the need of general hygienic measures to postpone as long as possible the period of growing old. The value of periodic health examinations is stressed as is the importance of cardiac clinics; of convalescent homes for patients with rheumatic fever and with decompensated hearts; of vocational guidance of cardiacs; and of a program of education of the public.—T. Stuart Hart, M. D. *Public Health Nurse*, Mar., 1928.

An Analysis of Anorexia—The fact that liver has been found so efficacious in the treatment of pernicious anemia by the regeneration of blood which, in turn, is demonstrated by the return of appetite, led to a study of the effect of a liver diet on children between the ages of 1 and 14 years who were suffering with anorexia or loss of appetite. Only those children who definitely presented signs of malnutrition in addition to the loss of appetite were considered.

Cases of anorexia may be due to organic defects or purely functional causes. Among the most common organic causes were found to be septic tonsils and adenoids, acute infections, tuberculosis and pyelitis.

In the determination of the treatment of functional anorexia, found in about one-third of the group, three methods were tried: (1) daily use of saccharated

iron; (2) daily use of cod liver oil; (3) addition of fresh calf's liver, broiled beefsteak and lamb's kidney to the diet three times weekly.

No comparison could be drawn between the effects of saccharated iron and cod liver oil but the results of these two were compared with the results of the liver, beefsteak and lamb's kidney feeding. Because with the addition of liver, the increase in weight was considerably greater than with the addition of cod liver oil or saccharated iron, it was concluded that liver may contain a specific stimulant to the appetite.—Walter M. Bartlett, M.D., *Am. J. Dis. Child.*, Jan., 1928.

Home Economics in High School—According to *American Child Health News*, the Manual Arts High School in Los Angeles, has tried the experiment of giving a course in home economics for boys. The latter apparently became interested in home economics for cosmetic reasons because of the general prevalence of acne. After looking into the matter of home economics they acquired a further interest in the preparation of food, and so a class was formed to teach the boys the principles of nutrition and diet. Later, cooking was added.

The final result was that a complete course was worked out for boys for the last two years of high school. An interesting result of this course from the point of view of the health educator was that the boys not only followed the proper dietary regulations themselves, but insisted on their families doing the same.—*Am. Child Health News*, Feb. 7, 1928.

PUBLIC HEALTH NURSING

MIRIAM AMES, R. N.

Baroness Sophie Mannerheim—Nurses throughout the United States and Europe are paying tribute to one of the greatest members of their profession. The death of Baroness Sophie Mannerheim in January of this year, brought to a close a long career of usefulness and service which exerted a widespread influence.

Baroness Mannerheim was born in Finland and educated in the Nightingale School, St. Thomas' Hospital, London, from which she was graduated in 1902. Two years later she returned to Finland to occupy, one after another, positions of importance. She was a moving force, whose wisdom in guidance affected the progress of nursing in her native land.

Her interest in other countries was manifested by her connection with the League of Red Cross Societies, her participation in the activities of the I. C. N. for many years, first as President, and later as Honorary President of the Council.

The nurses who attended the Helsingfors Conference in 1925 have an unforgettable memory of Baroness Mannerheim.

The Biennial Meets in Louisville—Will you be one of the 7000 nurses who will attend the Biennial Convention of the Three National Nursing Organizations, June 4-9, in Louisville, Ky.?

Headquarters for the convention will be in the Jefferson County Armory where the large general meetings will be held, and where a commercial exhibit of about 100 displays of interest to nurses will be conducted.

Dr. Charles Hubbard Judd, head of the School of Education at the University of Chicago, will be the speaker at

the opening meeting of the convention, June 4, at the Armory, his subject being "Adult Education." Convention members will be welcomed at this time by the Governor of Kentucky and the Mayor of Louisville, who will speak; and S. Lillian Clayton, President of the American Nurses' Association, will respond for the nurses. Brief talks will be given by Miss Clayton, Carrie M. Hall, President of the National League of Nursing Education, Anne L. Hansen, President of the National Organization of Public Health Nursing, and Clara D. Noyes, director of the Nursing Service of the American Red Cross.

Municipal Nursing Session will be held June 6, from 11 to 1 o'clock under the auspices of the N. O. P. H. N. The subject will be "Appraisal of Municipal Nursing Service," (a) "Tools for Measuring Nursing Service," discussed by W. F. Walker, D. P. H. of the A. P. H. A., and (b) "Factors Determining the Scope of the Nursing Program," by Emma Winslow, Ph.D., of the Commonwealth Fund.

There will be sessions on rural, school, tuberculosis and industrial nursing; on staff education and supervision; on relationships between community chest and public health nursing organizations.

Supervised Midwifery Versus ———?—Many Americans resent the insinuation that practices in their country are inferior to those abroad. Yet the low maternal mortality in certain European countries which have supervised midwife practices at least makes us question our own maternal mortality and our attitude on the subject of midwifery.

Scandinavia is one of the countries which has a system of supervised midwifery. Schools where midwives are trained are aided by government subsidies and are parts of large maternity hospitals. Here, girls who are recruited from the classes which would furnish student nurses in this country, receive a thorough training by means of practice and precept. They are trained to realize that childbearing should be a perfectly normal function but that abnormal conditions may develop, when a doctor is necessary. Therefore, they are taught to recognize these abnormalities. In the one or two years of training, ample opportunity is given for actual assistance in childbirth, as many as 80 or more cases being attended each year by each student under supervision.

Because most of the midwives or "maternity nurses" in Sweden go into rural communities where doctors are not readily reached, these women are taught certain obstetric operations. They are also taught to give prenatal advice and information about the general hygiene of the normal child in its first year.

Each midwife makes a report of her work periodically to a central authority. Additional requirements are that she take review courses of two weeks each at certain intervals and must retire at the age of 50. The results of this careful training and supervision may be judged in part by the low maternal death rates and the morbidity following childbirth.

While the Scandinavians are a homogeneous people and their physical development favors natural labor, yet they have the same sort of complications of pregnancy as exist in our country. However, proportionately there are not so many cases of sepsis as in the United States. Does the low maternal mortality and morbidity from sepsis in Scandinavia and the high maternal mortality and morbidity from the same disease in the United States indicate the

necessity for encouraging a similar system of midwifery in our country? Even in the United States, the midwife has been "credited with better results as far as sepsis is concerned than has the physician." But the haphazard way in which this practice is carried out in most parts of the United States demands a reform if this type of medical practice is to continue.

While there may be some objections to recommending supervised midwifery unreservedly in the United States, some solution of our high maternal mortality must be found by the medical profession.—George W. Kosmak, M.D., Results of Supervised Midwife Practice in Certain European Countries, *J. A. M. A.* 89, 24: 2009 (Dec. 10), 1927. B. J. B.

Scarlet Fever Review—Although we may be sure of our knowledge, an occasional review of the facts, especially when these facts are presented by an authority, is advantageous. Therefore, we are glad to have Dr. Dyer's summary of scarlet fever.

Occurrence—In the United States, scarlet fever is more prevalent in the North than in the South. It occurs during the cold months of the year, the peak being reached in December and January.

Susceptibility—Scarlet fever is primarily a disease of childhood, although it may attack persons of any age. Between 2 years and 9 years, children are most apt to catch the disease and the fatality is greatest.

Cause—Hemolytic streptococci are now regarded as being the cause of the disease. The germs are found in the throats of scarlet fever cases and their transference to the throats and nasal passages of susceptibles, either directly or indirectly, causes the disease in others. Bodily discharges are also infective. Like the diphtheria germ, scarlet fever germs not only cause a local reaction but also produce a poison which is absorbed by the body.

The Disease—There are three well established stages in scarlet fever: (1) period of infection; (2) period of eruption; (3) period of desquamation. In the first, the child becomes suddenly ill with sore throat and fever, often with vomiting. The tongue is furred and throat parched. This stage usually lasts 24 to 36 hours.

The eruption, usually appearing on the second day, may come out a few hours after the first symptom or it may wait for 48 hours. It appears first on the neck and chest and readily spreads over the entire body. This may persist for 2 or 3 days and then gradually fades, accompanied by a decrease in temperature.

The amount of peeling usually depends upon the intensity of the rash. Desquamation usually lasts from 10 to 20 days.

The severity of the symptoms depends upon the type of the disease. The tongue in scarlet fever has a characteristic appearance. At the outset, it is coated with white, the edges being red. The papillae appear as little red points. Later, the coating disappears leaving the tongue rough and red, the characteristic "raspberry tongue."

Inflammation of the throat is likewise a prominent symptom in scarlet fever.

Complications—The most common complications are inflammation of the kidneys, middle ear disease, endocarditis, adenitis, and joint affections. These may follow even apparently mild cases of scarlet fever.

Period of Communicability—Scarlet fever can be transmitted from the time of onset until the infectious agent has disappeared from the mucous membrane and from any discharges. In most uncomplicated cases, it is probably not infectious in the 4th week of an attack.

Carriers—Carriers in scarlet fever are persons with such slight cases that they are not known to have the disease, and convalescents who harbor the germs.

Prevention—The Dick test has been devised to determine susceptibility to scarlet fever. In this, a small amount of scarlet fever streptococcus toxin is injected into the skin. Susceptibility is shown by the presence of a reddened area, appearing in about 24 hours at the site of injection. Larger amounts of scarlet fever toxin may be given to susceptible persons to give them immunity (now five doses at weekly intervals are given). This method of immunization is especially useful in institutions and to protect nurses caring for scarlet fever patients.

Care of Scarlet Fever Patients—A patient should be carefully isolated. All but necessary furniture should be removed from the room where he is. Everything in contact with the patient should be cared for by itself, whether bedding, towels, eating utensils. After use, they should be kept an hour or two in disinfectant solution or boiled in soapsuds. Partially eaten food should be burned. Cloths or paper napkins, soiled with discharges from the patient, should be burned.

Precautions for the Attendant—As the hands

of the attendant may become readily infected in the care of the scarlet fever patient, unnecessary handling of the patient should be avoided. When contact is necessary, the hands should be cleansed in hot soapsuds. The attendant should also protect herself by covering hair and clothing. The coverings should be disinfected before being sent out of the room.

Disinfection—This is governed by the regulations of the local board of health. Gaseous disinfectants are probably useless. More effective is thorough cleaning of the room with soap and water and the action of fresh air and sunlight.

Treatment of Contacts—If scarlet fever occurs in a family of children, it does not necessarily follow that all the children will have the disease, especially if isolation is prompt and complete. Such contacts, if possible, should be sent away to relatives or friends having no small children. There they should be carefully watched for symptoms indicating the presence of the disease. They should be kept from school during this period. Adult members of the family, taking precautions and avoiding any contact with the patient, may come and go freely, except in the case of food handlers.

Many contacts may be protected by immunization with scarlet fever toxin (after a preliminary Dick test). When the test is given, cultures from the nose and throat should be made to determine presence or absence of the hemolytic streptococcus. If the test shows susceptibility and if there are no symptoms of scarlet fever (such as, temperature or sore throat), the first immunizing dose of toxin may be given. An exposed child with positive Dick test and harboring scarlet fever germs should be watched and should not be given further injections of toxin if symptoms exist. An exposed child with positive Dick test and symptoms of scarlet fever may be given an early therapeutic dose of scarlet fever antitoxin.

Precautions—The case should be reported immediately and all quarantine regulations strictly observed. A food handler in whose household scarlet fever occurs should discontinue business while scarlet fever remains on the premises. Even then, he should stay away from work until time has shown that other members of the family have escaped infection. Milk bottles, before leaving the house, should be thoroughly disinfected, and should not come into contact with the persons caring for the patient.

Control—Teachers, school nurses, and school doctors, can do much to control the spread of scarlet fever in schools. The teacher can exclude

from classroom any child appearing ill. Immunization of susceptible persons by the scarlet fever toxin may be used where chances of exposure are greatest. (This toxin has been used too short a time to permit a statement as to how lasting such immunity is.) In cases of deaths from the disease, a public funeral should not be held.

General Precautions Against Catching the Disease—Infections are more apt to be established where there are diseased conditions in the mouth; such as, defective teeth, or diseased tonsils and adenoids. Such conditions, therefore, should be remedied. Also, children should be taught to keep things out of the mouth which do not belong in it.—

Surgeon R. E. Dyer, U.S.P.H.S., Scarlet Fever: Its Prevention and Control. *Pub. Health Rep.*, 43,2:57 (Jan. 13), 1928. B. J. B.

Public Health Nurses, Illinois—The Illinois State Department of Public Health aims to inaugurate a nursing service in every one of the 102 counties of the state. At present 31 counties are without nursing service of any kind. The department has just received an added appropriation providing for an increase of staff from 4 to 15 nurses.—*Weekly Notes on Child Welfare Topics*, U. S. Children's Bureau.

Public Health Nurses, California—Requirements for applicant for examination for certificate as a public health nurse. Adopted by the State Board of Health, October 6, 1923. Amended July 31, 1925. Amended February 4, 1928.

Resolved, that each applicant for examination for certificate as public health nurse shall be:

1. Registered nurse under the laws of California.

2. Shall have completed a public health nursing course of eight months in a school approved by the California State Board of Public Health, or

3. Shall present evidence of having engaged in general public health nursing for at least 2 years in connection with a public health organization approved by the California State Board of Public Health.

4. In addition to the 2 years' practical experience evidence shall be required showing

that the candidate has attended a summer course of at least 6 weeks at the University of California, at Berkeley or Los Angeles, or a course of equal standard at any other university, or

5. In addition to the 2 years' practical experience evidence showing that the nurse has completed a 4 months' course in public health nursing, the outline of which has been approved by the California State Board of Public Health, will be accepted in lieu of the 6 weeks' course in public health nursing at a university.

6. All applications for examination as public health nurse shall be filed in the office of the State Department of Public Health, State Building, San Francisco, and shall be passed on by a committee of the State Board of Public Health.

7. All applications shall have attached to them an affidavit, sworn to before a notary public, as to qualifications outlined in paragraphs 2, 3, 4 and 5.

8. These regulations shall be in force and effect on and after February 4, 1928.—

State of California, *Weekly Bulletin*. VII, 2 (Feb. 18), 1928.

The Nurse's Part in Cancer Control—There is a tendency among those who have cared for patients with incurable cancer to feel that there is no hope where this disease is concerned. Yet research information tells us that one-fifth of the 5,000 persons who die each year from cancer in Massachusetts could have been saved if they had received treatment in time, instead of waiting until their condition was hopeless before securing medical advice.

If this is true for Massachusetts, it is also undoubtedly true for the rest of the United States. Has not the nurse a message of hope when she knows that there should be no skin cancers, that 70 per cent of the breast cancers could be cured if taken in time, and that rectal and also external cancers can be controlled or cured? The nurse can not only aid by urging early examination of superficial cases and prompt treatment, but she can also bear a message to those who are nursed in the home. Perhaps the best she can do for these is to de-

nounce the spending of money for quack treatment. She also can help persons to realize the dangers of the indiscriminate use of morphine which may be taken to alleviate pain.

The nurse can do much to help the cancer patient if she will courageously use the knowledge which is at hand.—Elizabeth Ross, *How Can We Help in the Control of Cancer*, *Pub. Health Nurse*, XX, 1:13 (Jan.), 1928.

B. J. B.

The Psychology of Keeping Young—Under the guise of this attractive title, a sound lecture in mental hygiene was given by Prof. H. Overstreet of the College of the City of New York at Ford Hall, Boston, Mass., in December.

Of course, it is understood that in a discourse of this kind the words "youth" or "senility" refer not to the physical body, nor to the mind taken as a separate entity, but to the subtle blending of the two which enters into the making of a personality.

However, for the purpose of illustration, he began with the causes of physical senility and debilitation. These were:

1. Poisons—endogenous or exogenous; that is, poisons produced within the body due to organic disorders or poisons introduced from outside, such as bacteria which start up toxic processes as soon as they find suitable conditions in the body.

2. Starvation—due to either the quantity or the quality of the food ingested. Now when we consider the causes of the aging of the "body-mind," we find these same two factors—poisons and starvation. In this case, the poisons are our emotions, those which are frustrated and are not allowed to be expressed either directly or through some other channel. We know how much we can be aided by our instincts and emotions; we are afraid of fire—

therefore, we avoid it. But if we saw fire, were afraid but could not escape, our lives would be endangered. In the same way, worry, anger, sorrow and all the other emotions are undermining if they are allowed to grow to enormous dimensions with no outlet for escape.

As to starvation, senility approach is rapid if we allow ourselves to fall into a rut and give ourselves no new interests. No matter what the physical age is, anyone who keeps abreast of the existing world and develops new interests as the years go by wards off the bugaboo of old age.

After dealing with the causes and prophylaxis of senility, Prof. Overstreet gave the symptoms (a rather irregular procedure but good for the morale of the audience which might have diminished had the process been reversed). The symptoms enumerated were talkativeness or the other extreme of silence, and the practice of reminiscence!

The lecturer made one amusing suggestion. He expressed the opinion that instead of determining a person's I. Q. by an intelligence test, it would be much more valuable to give him a senility test to serve as a warning of approaching danger. That would be the only kind of examination in which the lowest rating would give the highest honor.

H. Z.

(Miss Haigouhy Zouvickian, a staff nurse of the Community Health Association of Boston, is also one of the Editors of the *Community Health News*, which made its first appearance in October, 1927. The bulletin serves to keep the staff nurses informed of interesting phases of public health nursing, and changes in personnel. It is pleasing, both for its serious and humorous content.)—*Community Health News*, Dec., 1927.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

The Cost of a Community Bulletin—The attractive bulletin of the Dutch-ess County Health Association will illustrate the cost of getting out about 425 copies of an average monthly issue of six letter size pages:

When we are able to obtain cuts free of charge (of late we have been able to borrow them from the State Committee on Tuberculosis and Public Health of the State Charities Aid Association) we have the printer print the title and cuts only, for the first and last pages. The news items we multigraph here in our office. When we are unable to secure cuts, we simply multigraph the whole thing in the office, title page and all.

We buy a year's supply of paper (20,000 sheets) at a time, thus getting it more cheaply. Following is a list of the costs:

Paper	\$4.05
Printing (title and cuts)	3.40
Postage (1- $\frac{1}{2}$ c envelopes unsealed)	6.45
	<hr/>
	13.90

In addition it takes the office secretary approximately one week to address the envelopes, multigraph the letter, assemble, clip, fold, and insert it in the envelopes. Her salary is \$23.00 a week.

It takes me approximately the equivalent of one day's work to get the material in order to print.

Dorothy J. Carter, executive secretary, may be addressed at 16 Cannon St., Poughkeepsie, N. Y.

Health Poster Information—Information about health posters—present and future—is offered by the National Tuberculosis Association. The service starts with a loose-leaf binder containing posters or reproductions of posters, with descriptions and prices from 32 national organizations. Price, \$25. For an additional fee of \$7.50 per year, additions

will be made to the collection from time to time. This service should be of much interest and value to health workers who have thought out the poster situation and have learned how to discriminate between those that are good and those not so good. It is too easy now to secure mediocre posters. May the time come when not one man or one organization will select the posters, but when a representative group will offer a service in which the posters distributed will meet reasonably high standards in conception, text, design and printing.

Statistics in a Window Display—It seems possible to use a simple statistical comparison effectively in a window display. Perhaps you wish to show the downward trend of tuberculosis through a period of years, the upward trend of cancer or heart disease, or the increased use of a health center. The usual bar diagram may be replaced by a group of large cylinders made of colored paper. Add a solid background, say of dark cloth which the store window display man will have on hand. Size of cylinders and their distance from the background will be determined by experiment in relation to the width and depth of the window. Above the cylinders will run a concise caption done in modernistic style. Experiment may show that the caption can be supplemented by reproducing the diagram on a smaller scale on a card, thus making more obvious the larger display by cylinders.

The Nurse Must Know How to Arouse Interest—"She must know how to arouse community interest in a maternity and infancy program, in bet-

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

ter care for mothers and babies. That goes far beyond a mere publicity campaign. It goes into the realm of knowing how to arouse and make use of the latent interest of every group in her community, and by actually tying it into her program, making it come to life and amount to something."—From *Standards for Training of Public Health Nurses*, by Elizabeth Fox.

That means a *real* publicity campaign—and not "a *mere* publicity campaign"! At present it is difficult for the public health nurse to obtain training along these lines.

What Pennsylvania Does—The Bureau of Public Health Education, State Department of Health

. . . prepared 52 weekly health talks which were broadcast throughout the newspapers of the Commonwealth. Items for the *American Medical Journal*, the *Atlantic Medical Journal* and other publications were regularly released, as also were facts of interest to the newspaper reading public. Moving pictures circulated by this bureau for the year 1927 reached a total of 110. *Pennsylvania's Health*, the official journal of the Department, was prepared and issued six times during the year. The journal is now forwarded to 26,000 people, and for the entire year reached 132,000 first readers of all issues published. Campaigns in which this bureau took part involved the annual clean-up week, anti-fly activity. Lancaster welfare drive and Pennsylvania farm show.

Five Steps Leading to Better Health Education—Of course our printed matter and other educational material can be improved. Five simple, though vital steps to that end were emphasized at the 1927 Public Health Conference called by the American Medical Association:

1. More general use of accepted principles, technics and forms of skill adapted to our needs. I refer especially to the technic of printing, principles of psychology, and facility in writing in every-day language.
2. Employment of persons to do the work of health education who are trained to do it, and this means that we must first offer training.
3. Revision of the methods of supervision

and the working conditions under which preparation of health education material is carried on.

4. A philosophy and a program for the health education work of official and private agencies. Both of these elements are lacking in the work of many agencies.

5. Recognition of the time and thought that is necessary in producing publicity material that gets results.

"Will the Girls Be Interested?"—When the Girls Work Committee, Chicago Council of Social Agencies, started the "Girls Health Trail" project they had no idea with what enthusiasm the girls would respond.

Interest them in health habits we must, for we were desperately aware that young women living under present conditions of personal liberty and city tension were spendthrifts of health. . . . Could these independent, heedless schoolgirls or these hard working young girls in office and industry be interested in checking up their own health habits by means of a simple daily health chart? Would they submit to the physical examination which might disclose the presence of disease in time to enable them to secure the necessary attention to teeth, eyesight, etc.?

We have our answer. More than 7,000 girls have already agreed to keep the daily habit chart for three months. Our physical examination centers are overworked, even though all girls able to do so are requested to go to their private physicians.

"The Girls' Health Trail," is simply the united simultaneous effort of participating organizations to arouse civic attention to the health programs of individual agencies and to stimulate a more general interest in the health of girls.—

Social Service, Chicago, Ill. For a description of the "Trail to Health" see *Dairy Council News*, 910 South Michigan Ave., Chicago. March, 1928. *Free*.

SLIDES AND FILM SLIDES

The usefulness of the title-slide for lantern slides is emphasized in "The Sub-Title Applied to the Lantern Slide," by J. N. Emery. *Educational Screen*, 5 South Wabash Ave., Chicago, Ill., April, 1928. 25 cents. But of course the text and appearance should be comparable to the best of the screen captions. The

article tells how to utilize discarded photographic negatives, glassine wrappers from candy boxes, as well as the commercially prepared gelatin-mat-carbon combinations.

An example of the services offered by state universities is the slide material on health included in the 1927-1928 catalogue of Lantern Slides of the Extension Division, Indiana University, Bloomington, Ind. *Free*. (Outside of the state \$2 a week rental is charged.)

Film slides or strip films available through the Metropolitan Life Insurance Company, 1 Madison Ave., New York, N. Y., include "No More Diphtheria," "One Scar or Many," "Working for Dear Life," and "How to Live Long" (general health).

NEW PERIODICALS

Tuberculosis Abstracts, National Tuberculosis Association, 370 Seventh Ave., New York, N. Y.: A 2-page review for physicians. *Free*.

Postage has absorbed *The Mailbag*, and will continue publication of the combined magazine at 18 East 18th St., New York, N. Y.

Medical Progress, "a journal for laymen," American Association for Medical Progress, 370 Seventh Ave., New York, N. Y. Quarterly. \$1.00 a year. Sample copy *free*. "To diffuse among the lay public an understanding of research methods in medical science."

Food and Health Education, 468 Fourth Ave., New York, N. Y., has become *The Home Economist*.

Dry News is house organ of American Dry Milk Institute, 160 North La Salle St., Chicago, Ill.

FOR THE NEWSPAPER

The school nurse—Bureau of Education, Washington, D. C. News Release "P. N. 22124."

Preventive treatment for children's teeth—Bureau of Education, Washington, D. C. News release "P. N. 22125."

A series of news releases issued by U. S. Public Health Service, Washington, tell of world progress and national progress in public health. *Free*.

Again the *Syracuse Post-Standard*, in coöperation with the local Department of Health, published an Annual Spring Health Number, a 20 page tabloid magazine section of its March 18, 1928, issue. Samples *free*. Address R. W. Andrews, *Post-Standard*, Syracuse, N. Y.

Material to be worked into copy for bulletins and press releases: "Principal Causes of Illness in a Typical American City." U. S. Public Health Service. Released March 26, 1928.

The latest syndicated newspaper health column is "Health—How to Keep It," by Dr. Herman N. Bundesen. "All reader queries answered personally by mail." A recent week's series covered "Happiness—the Child's Tonic," "Is Your Child Jealous?" "Exercise for Health," "Character Building," "Overcoming Fear," "Mental Habits." Doubtless sample copies will be sent upon request to the Syndicate Department, *Chicago Daily News*, 15 North Wells St., Chicago, Ill.

"The total number of morning and evening dailies in the United States now is 1,949, compared with the previous year's 2,001. The total circulation of our evening papers now exceeds 23,000,000 copies daily; for morning papers the daily circulation exceeds 14,000,000 copies; Sunday total circulations exceed 25,000,000."—*Editor and Publisher*, Jan. 21, 1928.

STATISTICS

The Department of Commerce, Washington, D. C., will supply copies of "Estimates of Population for the United States and States for 1928." *Free*.

A few paragraphs explaining several simple features of vital statistics—in "Vital Statistics Are Interesting," by G. B. L. Arner. *Pennsylvania's Health*, Harrisburg, Pa. March-April, 1928.

BULLETINS

A good grade of envelope, in contrast with the cheaper manila envelopes, now gains a better hearing for *Campaign Notes of American Society for the Control of Cancer*.

The Canadian Red Cross, Toronto, Can., has gained in attractiveness and readability by reducing the amount of red on its pages and adopting a new typography. The contents, also, have become far more interesting and definitely helpful to its readers.

What insurance companies and insurance funds are doing to educate the public in various countries is told in "Insurance and Health Education." *World's Health*, Paris, France, Dec., 1927. 20 cents.

Detailed information about the 15 organizations comprising the National Health Council is given in a directory page of the *Monthly Digest*, 370 Seventh Ave., New York, N. Y. Copy free.

Several popular articles appear in the Special Milk Number of the *Northwestern Health Journal*, St. Paul, Minn. Nov., 1927. 10 cents.

Mental Hygiene Bulletin, National Committee for Mental Hygiene, 370 Seventh Ave., New York, N. Y., has been re-born in appearance and contents. Sample free.

NEWSPAPERS

Again *Editor and Publisher* issues its International Year Book edition with lists of dailies in many countries; city and Sunday editors named for many United States and Canada dailies; numerous classified lists; art and literary markets in the United States; books, schools, syndicates, mat and cut services, etc., 352 pages 10 by 13 inches. Jan. 28, 1928. Times Bldg., New York, N. Y. \$4.00 with year's subscription.

Fair and wise policies in dealing with the newspapers in emergencies are outlined in "Helpful Relations with Local Newspapers," by F. H. Williams. *Trained Nurse*. Oct., 1927. Especially

important are the detailed suggestions as to information to be supplied in writing, and the handling of telephone interviews.

MOTION PICTURES

"Just Around the Corner," is divided into three parts: Dependency, Health and Character Building. The Four Horsemen are brought into the scene of each picture in silhouette, representing Poverty, Evil, Sickness, and Death.

A great city with its tall buildings, shining lights and bridges sleeps under a seemingly calm exterior. Through the sky, riding swiftly, come the Four Horsemen, tramping down the weak, the sick, the helpless and the underprivileged.

The work of the visiting nurses, Infant Welfare Society, Occupational Therapy Department of the Junior Board and summer camps are shown under the section of Health. These agencies beat down the advance of the Horsemen who gallop through the scenes, holding the thrill of the picture.—

Otto Bradley, Community Fund, Minneapolis, Minn.

A film entitled "The Fly Majanka and her adventures" tells the story of an adventurous fly which gains entrance to a library and turns over the pages of a text-book of hygiene. She realizes the damage done by flies and calls a big meeting of flies at which she appeals to them not to settle on human food. The flies laugh at her and chase her away and she takes refuge in a doctor's house. There she turns her attention to the doctor and begs him to start a campaign. She shows him a mill-pond with larvae floating on it, leads him to the "Fly's Paradise," an insanitary rural privy, and altogether reads him a severe lesson. Majanka and her companion at length reach the farm of a peasant named Kluge, a model of cleanliness, who takes all the proper precautions against flies but complains that his efforts are of little avail since his neighbor cares not a rap. The doctor visits the careless neighbor and lectures to him about his dirty cowsheds, telling him the reason of his child's inexplicable illness from an infectious disease. Finally all the neighbors are converted and a great campaign against flies takes place. Every fly is destroyed except the adventurous Majanka, who, as befits one who has made history, is handed down to posterity in a museum!—

Reichsausschuss für Hygienische Volksbelehrung, Luisenplatz 2-4, Berlin N. W. 6.

EDUCATIONAL MATERIAL

The revised series of pamphlets and other publications of the American Heart Association, in course of preparation, have been classified as follows: (a) those for the workers, including physicians, nurses, secretaries and others; (b) those for the patients and their families; and (c) those for the general public.

Health-Diseases, Drugs and Sanitation. List of publications relating to these subjects. Revised. Superintendent of Documents, Washington, D. C. Price List 51. *Free.* New editions mailed as issued—if requested.

Safeguarding Your Health From Tuberculosis. Department of Health, New Haven, Conn. Well done 24-page pamphlet explaining to citizens "How New Haven Cares for Tuberculosis" through public and private agencies. A form of reporting the work being done.

The 50 million dollar welfare bond issue to be voted on in Pennsylvania in November is responsible for four 6-page folders issued by the Pennsylvania Mental Hygiene Committee of the Public Charities Association, 311 South Juniper St., Philadelphia, Pa. The copy is good, and the form is a good example of the better grade of quite inexpensive folder for widespread use. Of course the type should be larger, but the leading makes it quite readable. Each of the series is on a different color of paper. The titles: "Salvaging the Feeble-minded," "Handicaps of Epilepsy," "Why So Many Go Insane," "Do You Know?" Samples *free.*

A handy manual of 16 pages, *Health for the Family*, tells the residents of Bellevue-Yorkville district, New York City, of the clinics and services available. Page by page a type of clinic or service is described, with days and hours. Very well done—except that the

map might better have been an inch wider to gain in clearness and usability. Address Bellevue-Yorkville Health Demonstration, 325 East 38th St., New York, N. Y. *Free.*

An educational campaign against rickets conducted by Mulberry Health Center, 256 Mott Street, New York City, produced a series of exceptionally good 1-page leaflets, an 8-page pamphlet, and four posters (one of which is not so good). A sample set for \$1.50; set of leaflets, 10 cents; posters, 40 cents each. Special rates for quantities. Ask for "Plans for a Campaign Against Rickets." See reproductions in *Trained Nurse*. Jan., 1928. A brief account of the campaign in *Public Health Nurse*, March, 1928.

HONORABLE MENTION

Health, New Hampshire State Board of Health: for list of contents on cover page.

Fifth Annual Report of Quebec Provincial Bureau of Health: for a table of contents (called an index).

REQUESTS

Outline diagrams of the digestive tract are desired by Mabel Milhan, Home Demonstration Agent, Canton, N. Y. Please send your answer also to editor of this department.

Copies of posters and other material, as well as suggestions helpful in preparing a health exhibition will be appreciated by Dr. T. N. Mazumdar, Health Officer, Calcutta, India.

"On the average, what proportion of a welfare or nursing budget do you think might well be devoted to publicity purposes?"

Who has issued a folder or other publication entitled "The Cheapest Health Insurance"?

LAW AND LEGISLATION

JAMES A. TOBEY, LL. B., DR. P. H.

Sunk in committee?—The Jones Bill, S.3356, for federal health coördination has been transferred from the Senate committee on Commerce, of which Mr. Jones is chairman, to the Committee on Finance, of which Mr. Smoot is chairman. As a consequence, many observers believe that this measure will be permitted to repose peacefully there for some time.

As previously announced, the Parker Bill (H. R. 11026) passed the House early in March. When this was sent to the Senate it was referred to the Senate Committee on Commerce, of which Mr. Jones is chairman, where it is expected to receive favorable consideration. Mr. Jones at the same time introduced another bill (S. 3356) which was a counterpart of the Parker Bill. This bill was also originally referred to the Commerce Committee, but Mr. Smoot, Chairman of the Committee on Finance, somewhat belatedly discovered this and asked that Mr. Jones's bill be referred to the Finance Committee. This has been done and Mr. Smoot indicates that this bill will probably not be reported out of his committee. Since the bills are identical, favorable action on the original House bill will provide the desirable legislation for federal health correlation even if the Senate bill is killed in Mr. Smoot's committee.*

Senator Ramsdell has introduced a new bill for a National Institute of Health and this measure, S.3391, now contains none of the provisions for federal health correlation, but merely a proposal for \$10,000,000 for what is virtually a vast expansion of the Hygienic Laboratory.

A Federal Cancer Study—A thorough investigation of the means and methods whereby the federal government may aid in discovering a successful and practical cure for cancer would be made by the National Academy of Sciences, according to a bill, S.3554, introduced in the Senate by Mr. Neely. A report would be made to Congress for a plan for the participation of the federal government in eradicating cancer. In order to perform this task, an appropriation of \$100,000 would be authorized to reimburse the National Academy.

Anti-vivisection—A little late, but none the less offensive, the anti-vivisection bill has finally appeared in Congress as H. R. 11998. Instead of prohibiting experiments upon living canines, this particular measure makes it a misdemeanor for any person to operate or experiment upon a living dog in the District of Columbia or the Territories, except for the purpose of healing or curing the dog.

Oleomargarine Again—Hearings on Senator Norbeck's bill to extend the definition of oleomargarine to include substances churned, emulsified, or mixed in cream, milk, water, or other liquid, and containing moisture in excess of 1 per centum, were begun on March 27, 1928. Representatives of the U. S. Department of Agriculture, the Bureau of Internal Revenue, and various national dairy associations appeared in favor of the bill, while a Chicago lawyer representing the Baltimore Butterine Company, and the E. S. Vail Butteryne Company of Chicago appeared in opposition. He stated that manufacturers of

* For later developments, see page 639.

oleomargarine were back of the bill, the object of it being to eliminate the markets for yellow vegetable oil cooking products.

No money appropriated for the support of any ward, officer, or employe of the United States Government, civil or military, or for any veteran could henceforth be spent on oleomargarine, filled milk, or other alleged substitute for butter or other dairy products, according to a bill, H. R. 12246, introduced in the House by Mr. Sweet.

A bill, S. 3737, relative to the taxing of oleomargarine has been introduced by Senator Tydings.

An Osteopath as Surgeon General
—Characterizing it as "a vicious medical practice bill," the *Journal of the American Medical Association* seems greatly alarmed by a measure proposed by the only physician in the United States Senate, Dr. R. S. Copeland. According to this magazine for March 17, 1928, "Osteopath surgeon generals of the Army, Navy and U. S. Public Health Service are a possibility if a bill (S. 3592) introduced in Congress by Senator Copeland, March 10, becomes a law." The bill of the Hon. R. S. Copeland, M.D., provides that the degrees of doctor of medicine and doctor of osteopathy shall be accorded the same rights and privileges under governmental regulations, whatever this phrase means.

A proposal to regulate osteopathy in the District of Columbia, H. R. 16, was favorably reported to the House on March 28 and discussed at length in the House on April 9, though without action other than talk.

The chiropractors have also received some recognition from Dr. Copeland, for at hearings on a medical practice bill for the District of Columbia before a subcommittee of which he is chairman, Senator Copeland agreed to the contention of these cultists, supported by Senator

Capper, that they should have a separate examining board, mentioned by name in a medical practice bill for the District.

Honors for the Heroes of Health
—Recognition for the survivors of the famous yellow fever experiments in Cuba and also for the wives of those concerned who have died is contained in bills submitted to Congress, in the House by Mr. Wainwright as H. R. 11686, and the Senate by Dr. Copeland as S. 3364.

The persons whose names the War Department would be directed to place on its roles and pay \$250 a month are as follows:

Mrs. Walter Reed
Mrs. James Carroll
Mrs. Jesse W. Lazear
Dr. Aristides Agramonte
Pvt. John H. Andrus
Mr. John R. Bullard
Pvt. A. W. Covington
Pvt. William Dean
Pvt. Wallace Forbes
Pvt. Levi E. Falk
Pvt. P. Hamann
Pvt. James F. Hanberry
Mrs. Warren G. Jerneagan
Pvt. John R. Kissinger
Mr. John J. Moran
Pvt. William Olson
Pvt. Charles G. Sonntag
Pvt. Clyde L. West
Dr. R. P. Cooke
Pvt. Thomas M. England
Pvt. James Hildebrand
Pvt. Edward Weatherwalks

The bill also calls for a National Honors Commission of seven who would investigate all cases of distinguished service of public servants by voluntary risk of life or health and recommend proper recognition for such service.

On March 15 the House passed a resolution to change the name of the Ancon Hospital in the Canal Zone to the Gorgas Hospital.

Gorgas Memorial Laboratory— Apparently without a dissenting voice and amid lavish praise for General Gorgas, the House on March 28 passed the bill, H. R. 8128, to authorize a permanent annual appropriation for the maintenance and operation of the Gorgas Memorial Laboratory in Panama. The measure calls for \$50,000 to be paid to a benevolent corporation organized to establish and maintain this laboratory for the study of tropical and preventive medicine. The Republic of Panama has already donated the site, and the president of this republic has pledged an appropriation of half a million dollars or more for the construction of the laboratory. By the terms of the bill each of the Latin-American countries is to be invited to contribute, the total not to exceed 75 per cent of that appropriated by the United States. One member of Congress seemed to express the sentiments of the whole House when he said, "I think the passage of this bill is the best thing we can do from the national standpoint, from sanitary and health needs, and from the standpoint of admiration for and as a memorial to one of the world's greatest physicians." Then the House broke into applause.

Other Matters before Congress— A revision of the International Sanitary Convention of 1912 has been ratified by the Senate. The text of this treaty appears in full in the *Congressional Record* for March 22, 1928. In addition to the numerous bills granting federal medical relief to various classes of veterans suffering from tuberculosis, a new one, H. R. 11948, would extend such relief to any person discharged from the Navy or Marine Corps who contracted the disease as a result of duty. A bill for the advancement of funds in connection with the enforcement of acts relating to narcotic drugs passed the Senate on March 22. A \$15,000,000 hospitalization program has been agreed upon

by the Committee on World War Veterans' Legislation of the House and was to be embodied in legislation.

An interesting study of pending legislation relating to federal medical and surgical relief for diseases and injuries of civil life, by Dr. William C. Woodward, appears in the American Medical Association *Bulletin* for February, 1928.

A case of Medical Negligence in Ohio—A physician who treats a patient for smallpox must report the case to the health officer, and it is also his duty to warn other persons, who are known by him to be in dangerous proximity to the patient, of the existence of the disease. Failure to perform this duty will constitute negligence on the part of the physician and a person injured thereby may recover damages. Instructions to this effect must be given by a trial court in its charge to the jury, and a refusal to do so constitutes prejudicial error.

These principles outlining the proper duties of physicians have recently been enunciated by the Supreme Court of Ohio in the case of *Jones v. Stanko*, a copy of which has been sent us by James E. Bauman of the State Department of Health. The facts were that from a Tuesday to the following Saturday, one Dr. Washington L. Jones attended a patient who had black smallpox. This physician did not report the disease to the local health officer, and he permitted Mr. Stanko to wait on the patient, assuring Mr. Stanko that no danger was involved in such service.

Both the patient and Mr. Stanko died of black smallpox, the latter death obviously being due to the incompetence or negligence of the physician. The law requires a man who engages in the general practice of the medical profession to know when he is dealing with diseases which are dangerously contagious, and he must exercise ordinary skill and care relative to these matters.

The trial court refused to charge the

jury as to the negligence of the physician and he won the case there. This decision was properly reversed by the Court of Appeals, whose action was sustained on appeal to the court of last resort in the state, the Ohio Supreme Court. This is a good decision, promoting public health by pointing clearly to the duties of the physician to the people.

Miscellaneous Items—The Chicago drainage cases were set for a hearing on April 23 before the U. S. Supreme Court on exceptions to the report of the special master, Charles Evans Hughes.

A donation to a fund to combat disease is deductible in computing income tax, in the opinion of the General Counsel of the U. S. Bureau of Internal Revenue (Memo. 3016). The opinion, with the method of computation in the particular case is given in the *United States Daily* for March 19, 1928.

A world conference of immigration, including consideration of health, opened at Havana on March 31.

The United States sent an unofficial delegate to attend the opium conference at Geneva beginning April 12.

Provisions in state laws for indemnities for tuberculous cattle is given in the *Congressional Record* for March 28, 1928 (page 5707).

A tack in a dish of strawberries which later lodged in a customer's jaw has been held not to constitute evidence of negligence by a restaurant keeper, according to a recent decision of the U. S. Circuit Court of Appeals for the Third Circuit, Horn & Hardart Baking Co. v. Lieber.

Conviction for the illegal taking of clams from areas proscribed by the State Department of Public Health has been upheld in Massachusetts in Com. v. St. John, 159 N. E. 599.

CONFERENCES

May 10-12, American Association of Hospital Workers, Memphis, Tenn.

May 23, American Climatological and Clinical Association, Washington, D. C.

May 23-26, American Physical Education Association, Baltimore, Md.

May 28-June 2, American Library Association, West Baden, Ind.

May 28-June 7, General Federation of Women's Clubs, San Antonio, Tex.

June 4-9, Biennial Nurses Convention, Louisville, Ky. (American Nurses Association, National League of Nursing Education, National Organization for Public Health Nursing)

June 8-9, Conference of State and Provincial Health Authorities of North America, St. Paul, Minn.

June 12, American Heart Association, Minneapolis, Minn.

June 18, Regional Meeting American Public Health Association, Portland, Ore.

June 18-23, National Tuberculosis Association, Portland, Ore.

June 20, Canadian Tuberculosis Association, Charlottetown, P. E. I.

June 25-29, American Home Economics Association, Des Moines, Ia.

July 8-12, Congrès International de la Protection l'Enfance, Paris, France.

July 8-13, First World Congress of Social Workers, Paris, France.

July 16-21, Thirty-ninth Congress Royal Sanitary Institute, Plymouth, England.

December 28, International Congress of Tropical Medicine and Hygiene, Cairo, Egypt.

October 15-19, American Public Health Association, Chicago, Ill.

BOOKS AND REPORTS

The Principles of Ante-Natal and Post-Natal Child Hygiene—By *W. M. Feldman, M. D., M. R. C. P. (Lond.), F. R. S., (Edin.)*, London: *John Bale, Sons & Danielsson, Ltd.*, 1927. Price 25s. (American Public Health Association, \$7.50.)

This is a type of book which one reads with delight, but reviews with a great feeling of diffidence. Indeed criticism of such a book can only be regarded as presumption on the part of the majority of reviewers.

It is divided into three parts, the first of which defines the subject, gives a general survey of it, a most interesting chapter on the history and development of child hygiene, statistical methods, antenatal and intranatal mortality and maternal mortality. The second part is devoted to antenatal hygiene, while the third part is given to hygiene from birth through the childhood stage, with a short chapter on "Adolescence or Puberty."

In reading the chapters, one finds no question left unanswered, and though some deal with rather difficult subjects, they are written in such clear language that the understanding of them is easy to any educated person. The only exception to this statement is the one on biometrics which, though clearly put, will be found difficult by many readers. It requires some training in mathematics.

The author well states in his preface that he believes this is the first book of its kind in any language. It is designed to appeal to educated and thoughtful persons, whether lay or professional, who are interested in the welfare of children, and, we might add, the race.

The book gives many quotations from

ancient as well as modern writers. It is abundantly illustrated and contains a large number of portraits of those who have worked for the benefit of children, in the past as well as more recently, in addition to which there are 159 illustrations in the text. Among the illustrations one of particular interest shows the headstones of Benjamin Jesty and his wife, the inscriptions on which are easily legible. Besides the illustrations and photographs, there are many tables and charts.

We feel safe in predicting that for many years this book will hold its own as a standard text and reference. It is written as a companion volume to *The Principles of Ante-natal and Post-natal Child Physiology*, which appeared in 1920, and was favorably received. The printing of the book is excellent, but unlike most English books, the paper used is heavy and does not have a mat surface.

This book deserves a longer and more detailed notice, though it would be impossible to mention the many things worthy of special commendation. It must be read to be appreciated.

M. P. RAVENEL

The Chemistry of Water and Sewage Treatment—By *Arthur M. Buswell*. New York: *Chemical Catalog Co.* 1928. 362 pp. Price, \$7.00.

While written primarily for chemists, this book is of much interest to the sanitary engineer and the biologist interested in water purification and sewage treatment. The author prefaces the more technical discussions with two introductory chapters dealing with recent developments in chemical theory and with the chemistry of colloids. Although to the

chemist, it may seem almost absurd to discuss the subject of colloids in 20 pages, such a condensed and well written presentation is a boon to the bacteriologist.

The chemistry of water treatment is discussed in chapters dealing with water softening, filtration and disinfection. One chapter is devoted to the chemistry of coagulation and is particularly to be commended. No attempt is made to give detailed descriptions of filters or to describe operating practice.

The chapters on sewage are of interest because the author has attempted to collect and digest our knowledge on the biology of the methods. The statement, "comparatively little biological data of practical value are available" cannot be too strongly emphasized. There has been a tendency to regard the changes which take place in the trickling filter and in the activated sludge process as purely physico-chemical in character. We are glad to find that the author does not sympathize with this point of view, but apparently believes that colloidal reactions and bio-chemical changes induced by microorganisms are at least equally important.

The book is a real contribution to what we hope some day to be able to call "the science" of water and sewage treatment.

JOHN F. NORTON

Pulmonary Tuberculosis—By David C. Muthu, M.D. (2d. ed.) New York: William Wood, 1927. 381 pp. Price, \$5.00.

In this second edition of his book, Dr. Muthu has added an introduction of some 120 pages to his old text. In fact, there is very little change in the old text and the only new thing about the book is the introduction.

In it the author takes up discussion of the tuberculosis problem from the statistical, research, clinical and environmental points of view, with some extraneous observations at the end on

tuberculosis in India. As a summary of existing knowledge of tuberculosis work, the book has some merit and would have more if it were not for the fact that the author seems to have gone on the fallacious theory that everything appearing in print is authentic. For example, Abrams of late lamented quack fame, with his electronic theory which has been so completely discredited in this country, has been quoted with such authorities as Koch, Webb, Calmette and other workers of genuine responsibility and fame. Even more, the author goes out of his way to give a somewhat fulsome laudation to the Abram's theory, which is enough to discredit the book entirely.

PHILIP P. JACOBS

The Concise Oxford Dictionary of Current English—Adapted by H. W. Fowler and F. G. Fowler. Oxford University Press, 1926. 1064 pp. Buckram, Price \$3.50.

To everyone interested in the correct use of words, this dictionary will be a joy. The names of the two men who have adapted it from the *Oxford English Dictionary* are sufficient guarantee of its value, and those who have used *A Dictionary of Modern English Usage*, by one of the authors of this book, will be especially glad to have the present volume.

While holding to many of the usages which we Americans recognize as typically English, the authors have given way to a certain extent, though they have "stopped short of recognizing forms that at present strike every reader as Americanisms."

The book is well printed, though some typographical errors have been found. It may be had in a number of bindings, on various papers, and indexed, the prices running as high as \$17.50 per copy. It can be unreservedly recommended to everyone, and especially to those who attempt to write.

M. P. RAVENEL

A Treatise on Hygiene and Public Health—With Special Reference to the Tropics—By Birendra Nath Ghosh, F.R.F.P. & S. (Glasg.) Revised and largely rewritten with the advice and assistance of Colonel A. B. Fry, M.D., (Lond.), D.P.H., (6th ed. rev.) Calcutta: Scientific Publishing Co., 1927. Price, 10 s.

When an author is called upon for six editions in a period of 15 years, he is entitled to believe that his work has been successful. The first four editions of this book were written in connection with J. L. Das. The last two have been published under the present author's name.

The text considers the usual subjects commonly discussed under the head of hygiene and public health, but this book is particularly interesting as giving us conditions as seen in India. There were certain defects in the fifth edition which have been largely remedied in the sixth. We believe, however, that too little is said about dried milk, for example, to which only a few lines are devoted.

The author advocates cremation, which is needed in India probably more than any other country in the world. When we remember the overcrowding and the beliefs which have become ingrained through many generations, we can appreciate the difficulties which the hygienist faces in that country. Infant and maternal mortality are still terrifying, and it is estimated that from 60,000 to 75,000 women die every year from conditions connected with child bearing.

Vitamins are included in this edition, though there is some confusion about the name. Funk believed that they were amines, and only later has the "e" been dropped from the name as given by their discoverer.

The volume bears throughout the stamp of careful study, honest interpretation of the facts, and common sense. The English is exceptionally good, in spite of the fact that it is not the native

language of the author. A glossary giving the English equivalents of the Indian names used would improve the book, though most are found somewhere in the text. The illustrations and printing are good. The book doubtless does an enormous amount of good in the country for which it is written, and can be read by all hygienists with pleasure as well as profit. M. P. RAVENEL.

Cultivating the Child's Appetite—By Charles Anderson Aldrich, M.D. Macmillan, 1927. 127 pp. Price, \$1.60.

Dr. Aldrich's book covers a very important subject in a most unusual way. It is simple, straightforward and to the point. I believe every mother would profit greatly by reading it and the children should profit even more.

There are a few important points to which I take some exception:

More stress should be laid on the fact that anorexia is due to the shortcomings of the parents rather than to the children. Of course, there may be a few exceptions and these are due to outside influence such as teachers or nurses. This is very well illustrated by the fact that poor children are seldom afflicted while the children of the rich are very commonly affected in this way.

More stress should be laid on causes for this condition. I believe the cause of poor appetite is very largely physical. It is the result of disease or at least an abnormal condition of the patient. Any child with a poor appetite should be considered sick. The causes of this condition are too much excitement, too much discipline, too much work. More is expected of the rich child than of the average child and in consequence the former falls under the load he is forced to carry. He may appear all right but in reality is not well. Instinct tells him not to eat and if left to himself long enough he will correct the condition. When a child does not want to eat it should not be forced. ROBERT E. HUMPHRIES

An Experiment With Time—
By J. W. Dunne. New York: Macmillan,
1927. 208 pp. Price, \$2.50.

The only way to find out whether the author is dealing with real experience or with a hoax in the grand style is to try to repeat his "experiments." These experiments consist of recording as fully as possible details of what is in one's mind at the moment of waking or when in a semi-dormant condition, and subsequently comparing these items with waking experience. In a large number of cases the experimenter will discover these dreams have anticipated events. What that proportion is can never be ascertained of course, since we notice only what we notice, and we shall not notice the dreams which are never recalled in subsequent waking experience; nor should we count the dream items that have to do with commonplace events and experiences that occur before as well as after the time of our record. Mr. Dunne speculates learnedly on the nature of space and time, and leaves us with the impression that perhaps our time experience is after all reversible. While he has a number of very striking examples of dream stuff apparently anticipating experience, it must be said that most of his stories represent no more than the fact that a minute fragment of the situation is capable of recalling a totally different situation in which a few elements are present in common. Until we have a large body of similar "observations" against which it is possible to check, we shall not be convinced that Mr. Dunne has really discovered a novel quality in the structure of time.

The book on a whole is an introduction to a new interpretation of the universe which the author calls serialism, with distinct psychological, theological, and teleological aspects. It is proverbially difficult for a new philosophy to gain recognition; and the reviewer would really like to help.

B. C. GRUENBERG

The Bacteriolytic Tank System in South Australia—By W. Ramsay Smith, M.D., D.Sc., F.R.S. (Edin.) (7th ed.) Adelaide: Gov. Printer, 1927, 48 pp.

This pamphlet contains very little new information. Its scope "is limited to the problems of sanitation in unsewered areas, the sanitary appliances that are obtainable and the sanitary standards that are attainable in such areas."

To those interested in the background of the septic (bacteriolytic) tank in Australia and the literature thereon, portions of the pamphlet will be valuable.

The description of the tank is sufficient to permit an understanding of it, but from the viewpoint of practice in this country the sketches and plans included in the pamphlet could not be considered as particularly useful in helping the rural house owner to build his own tank. In parallel pamphlets published here, much space usually is devoted to the careful and detailed explanation of form-building; the lumber needed therefor; concrete mixing and such related matters. Explanations of this variety are lacking in this pamphlet.

The last four chapters are devoted to discussing a number of Australian installations; what goes on in the tank; the control of the use of such tanks by the official health agencies of Australia; and the economic value of the tank system to that country. ARTHUR P. MILLER

The Human Body in Pictures—
By Jacob Sarnoff, M. D. Brooklyn, N. Y.: Physicians and Surgeons Book Co., 1927. 120 pp. Price \$2.00.

This is a unique presentation of a visual text of anatomy, physiology and embryology. It is written in a simple compact style. With its wealth of illustration it should appeal to high school students, especially if correlated with their other science work. This book appears to be one of a series on the human body presented by film slides, motion pictures and textbook. B.C.G.

Diseases of the Skin—By Henry H. Hazen, A. M., M. D., (3rd ed.) 248 ill. St. Louis: Mosby, 1927. Price, \$10.00.

A book which has reached the third edition has already run the gauntlet of professional criticism, and if it has met with success, which is usually proved by the demand for new editions, it needs little comment. A striking feature of the present edition is the omission of the usual long discussions on eczema, though the name is still retained in one case, and as a synonym in two others, in spite of the fact that the author states in his preface that the word has been omitted. The wisdom of this is shown by quotations from two other dermatologists:

Eczema is a term commonly applied to any wet or scaly inflammation of the skin, of the cause or nature of which the observer is ignorant.

. . . Eczema is only a sort of dermatological scrap heap out of which from time to time, certain diseases that present a characteristic and definite symptomatology are extracted.

The various skin manifestations of anaphylaxis are given more attention than usual. We commend the author also for omitting the bibliography which, as he says, has been found to be of no value to students.

The book is beautifully printed, has very few errors, and is abundantly illustrated with excellent photographs, most of which are original with the author. We wish our American publishers would use the light paper now available. Although this book contains only 572 pages, its weight is burdensome.

M. P. RAVENEL

Health Problems in Organized Society—*Studies in the Social Aspects of Public Health*—By Sir Arthur Newsholme, K.C.B., M.D. London: P. S. King & Son, Ltd., Orchard House, Westminster, 1927. 253 pp. Price, \$3.50.

The chapters contained in this volume are made up of lectures and addresses given over a period of several years in America and in England. A book of this character is not easy to review, since so

many different matters are treated. There is some repetition, which the author has lessened to a great extent by cross references. Each chapter, however, considers the social aspect of the particular problem under discussion, and stress is laid on the importance of cultivating the sense of personal as well as communal responsibility, and the ethical side of public health work. The author feels that it is more important to secure for each child the fullest mental and moral development possible, than to extend research into diseases, the causes of which are still unknown, though he does not belittle the importance of research.

There are 19 chapters, each of which is well worth reading. The author has been a teacher and public health administrator for 45 years. He has read widely, and frequently gives striking quotations from older writers, whose works are unknown to the majority of the present generation. Throughout the book, he lays especial stress on the moral side of preventive medicine, holding that the health officer who concerns himself only with measures for preventing infection is bound to find his efforts sterile. Alcoholism, tuberculosis and venereal disease have been chosen as the three great subjects with which to illustrate the possibilities of life saving and national health improvement.

There are several chapters on the history of the control of alcohol, besides frequent references to it, the author being strongly in favor of prohibition. While interesting, we believe that he has accepted evidence which is far from having been proved, and some of which has been disproved.

The last two chapters are devoted to the problem of population, in which he confesses that he shows his personal bias in regard to disputed matters. Here again, we think that he has overlooked some facts. He says that the forecasts made by Malthus have proved to be false

up to the present time, though he acknowledges that the population of the world has more than doubled in the last hundred years. He discusses various factors which have interfered with what Malthus predicted, pointing out the changed trend of population seen in Western European countries and America, and believes that it is due to widespread use of contraceptive measures.

The book as a whole shows the distinguished author at his best. Few living men have been so closely in touch with the growth of public health, especially in England, but also in other countries, and none have used their opportunities to better advantage.

Perhaps the most striking feature of the book is the high moral standards which are inculcated, on which everything else seems to depend. He believes strongly in education, holding that the best educator is the man who waits on and aids the development of the human mind, and that our "basic need is to train the behavior of the individual in the varying circumstances of life," the lack of such training being responsible for the continuance of a vast amount of preventable disease.

The printing and make-up of the book are exceptionally good. The paper used is of the light weight so generally found in English books, and so often not found in those of American origin.

M. P. RAVENEL

To Whom It May Concern: A Popular Address About Smallpox and Vaccination—*By William Wanklyn. London: The Voluntary Service Fund. 1927. Price 1/6.*

The Case Against Vaccination—*By Councillor W. Asbury. London: Journal of the Royal Sanitary Institute. Vol. XLVIII, No. 4, 1927.*

From deep convictions growing out of many years of field experience with smallpox, both as physician and as special consultant for the London and other

county councils, Dr. Wanklyn writes with remarkable restraint, and earnestly appeals to his fellow citizens to join in a united effort "to clear smallpox right out of the country once and for all," by means of systematic use of vaccination. There are many dramatic personal episodes, as well as some useful statistical and historical material.

Equally earnest is Councillor Asbury of Sheffield City Council, in his opposition to vaccination. Like so many lay partisans he rests his case primarily on the older fears and suspicions. After all, it is not obvious how so "unnatural" and bizarre a procedure as vaccination can bring about immunity to smallpox. Moreover, fashions and claims have undergone many changes, and there have been deaths and disasters closely associated with vaccination which the writer is unable to reconcile with the vaccinator's present position. Fragmentary quotations from authorities and from statistical records can of course be offset by other quotations; he uses only one set.

The councillor is worried, and it is manifestly insufficient for those who favor vaccination to shout louder.

B. C. GRUENBERG

Boiler Feed Water Purification—*By S. T. Powell. New York: McGraw-Hill. 1927. 363 pp. Price, \$4.00.*

The purification of water for industrial purposes is largely a problem for the factory although several cities in this country have municipal softening plants in operation. Water softening is also practiced in homes located in hard water regions. The discussions in this book deal with all phases of the problems involved, such as chemical coagulation, filtration, various methods of softening, distillation, the use of boiler compounds, prevention of foaming and priming and of corrosion and the use of feed water heaters. Methods for the analysis of boiler waters are given in detail.

JOHN F. NORTON

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Providence, R. I.—A valuable set of public health, milk inspection, and vital statistics reports for the year 1926 has been received from Providence. These reports conform in attractive appearance, good printing and subject content to the high standard established in this city many years ago. They are worthy of study by health administrators.

The report of the superintendent of health gives a birth rate of 22.5, a death rate of 13.1, and a marriage rate of 15.9 for the year. A classified financial statement for this city of 270,400 population shows that \$192,937 were expended by the health department, but of this amount, \$93,259 were expended for garbage removal. One of the interesting features of the report is a section on the appraisal of health work in Providence according to functions.

In a section dealing with the supervision of infants and preschool children, it is interesting to note that the distribution of prenatal letters to prospective mothers was begun in October, 1925. From that time to the end of 1926, 1,379 requests were received for these prenatal letters. Five nurses supervise the babies delivered by midwives, up to 2 years of age; one nurse supervises the infants and young children in licensed boarding homes and the infants of such unmarried mothers as are not under the supervision of private agencies; one nurse makes one visit upon each infant delivered by a physician, provided the mother is not on the maternity service of the District Nursing Association, or delivered at the Lying-in Hospital. Thirteen child welfare stations were carried on by the Providence Child Welfare committee, the examining doctors being engaged and paid by the health department. The district nurse association employs 17 nurses on its children's

services and during the year they had 5,993 infants and preschool children (68 per cent under 1 year) under supervision. The nurses made 38,452 home visits to these children in addition to 3,999 prenatal visits to 1,403 prospective mothers. A total of 10,308 visits were made by infants and young children to the welfare stations. In a newly opened preschool clinic, children not only are given a complete physical examination, but generally receive toxin-antitoxin treatment for diphtheria immunization. An infant mortality rate of 68 is recorded.

Of the 20,646 school children examined, 59 per cent were found to have defects. Treatment of defects was secured in 70 per cent of the instances recommended. Among the special classes and clinics there is a psychiatric clinic where 483 examinations were made. Several of the problem cases were fully studied at the Problem Clinic of the Rhode Island Hospital and at the Mental Health Center at the Esek Hopkins School. There are 11 open air schools, 2 for pupils of grammar grades and 9 for primary grade children. A school for crippled children was opened in 1925, where a physician examines all applicants upon admission and before leaving.

The superintendent of health is also ex-officio inspector of milk. According to regulations effective January 1, 1926, it was provided that all milk sold in Providence should be certified or from cows under government supervision, or pasteurized. Milk from cows under government supervision must not have more than 100,000 bacteria per c.c., and pasteurized milk must not have over 1,500,000 before pasteurization, and not over 100,000 after pasteurization. A law enacted at the instigation of the farming interests has fixed the maximum

bacterial content of Grade A pasteurized milk as 25,000. The average bacterial count of the Grade A pasteurized milk sold under the state law after July 1 was 12,000.

The vital statistics report contains important tables frequently used. Deaths are classified by months, according to sex, marital condition, color, nativity and parentage; by month and cause; and by sex, age and cause (International List). Births are classified according to season, sex and color; and according to number of child and age of mother. Of the 6,090 births, 2,576 occurred in hospitals. A general summary table, condensed into 5-year periods, gives important statistical data since 1855. Deaths under one year are classified by cause and age, as well as according to nativity of mothers.

Queensland—The annual report of the Commissioner of Public Health for the year ending June 30, 1927, opens with brief statistical records of the birth, death and infant mortality rates for that state and also for other states of the Commonwealth and several parts of the Empire. Infant mortality rates in 1926 are noted as varying from 39.8 in New Zealand and 50.4 in Queensland, to 57.6 in New South Wales. Diphtheria apparently reached its peak during the year, although not confined to a particular area.

Arising out of a deputation representing the Australian Coachmakers Employees' Federation and the House Painters' Union, which waited upon the Minister with reference to the use of the spray "gun" in the application of paints and the toxicity of the substances employed in such processes, samples of all "spray paints" in use upon the local market were procured and have been analyzed by the government analyst. As a result of the discovery that soda and water issued from certain soda fountains contained lead in excessive

amounts, a series of samples were obtained from all cafes and refreshment rooms. This necessitated the dismantling and overhauling of a large number of fountains when it was found that the interiors of certain carbonators were jointed at the seams, at the ends of agitator shafts, and elsewhere with solder which contained lead. All faulty solder was replaced with lead-free material, and in numerous instances fresh tin lining was provided.

Madras—Features of the health officer's 1926 report which first impress the reader are the size of page (8¼"x 13"), the large size of type and the soft paper. Paper of glossy finish is used here only when photographs or statistical charts are included. The report occupies 209 pages. High mortality and morbidity rates are explained to a considerable extent on the basis of economic problems. Considerable laboratory work has been carried on in the control of water supplies. Housing inspection has been active and attention is directed to the need of a comprehensive development plan of housing for the entire city, based on a scientific as well as a business viewpoint. The National Health and Baby Week celebrations were conducted in the South Indian Athletic Association grounds and premises from the 14th to the 20th of January. Charts, posters, health models, and leaflets were widely utilized. Excellent photographs of the child welfare motor car and of maternity and infant clinics add interest to the report.

Education of Employed Youth—The proceedings of a special conference held in New York* on the education of employed youth are worthy of study by educators and health workers. A carefully prepared article on health education in the continuation schools presents data

* The University of the State of New York, Albany, 1927.

which suggest among other things the shortcomings of School medical and nursing programs as at present carried out. "We had either failed completely to recognize persistent defects or had failed to persuade the families of boys of the desirability of improving or correcting the various types of physical defects discovered."

It is stated that before planning any system of health instruction in continuation schools, the type of audience and the background must be considered. Youth in industry must be cautioned effectively against the kind of hazards they are facing and where there are continuation schools in communities, where certain types of industries are likely to absorb children, special attention should be paid to train the children in the avoidance of the hazards in the particular industries. "There can not be any really effective education of the children in continuation schools until they have a point of departure for their education, and by that I mean a thorough medical examination." It is emphasized that there is no greater damage to health, to resistance to disease, than allowing children of school age to have insufficient sleep and rest. Special precautions in this regard are necessary for children who have the combined burden of earning a living and at the same time keeping on in school education. An outline of a "practical health program for employed children" is contained in this report for the guidance of those concerned with the organization of the health and recreation work in the continuation schools.

Hamilton, O.—A journey through the city health district of Hamilton, during the last 3 months of 1927, is made possible for readers of the sanitary report by means of many cartoons, with brief tabular material and discussion. The form of presentation is sufficiently unique to cause the average reader to

peruse the entire report. Information is given regarding the scores of barber shops, dairies, restaurants, confectionery and grocery stores, ice cream plants, markets, and drug stores. The periodic health examination by the family physician is featured.

Scott County, Ky.—The population of Scott County is indicated in the 1927 annual report of the Health Unit as follows: white 13,800, colored 1,518. This county covers an area of 290 square miles, there being 2,753 homes and a school enrollment of 2,800. The director of the health department emphasizes the value of the coöperation received from the medical profession, educational institutions, the press and civic clubs. Laboratory services have been rendered by the State Board of Health and experiment stations. Physical examinations have been made of children in the rural and city schools and the college, defects have been noted and efforts have been made by the follow up work of the nurses to secure their correction. Commendable progress has been made in health education by means of lectures, bulletins and nursing follow up work.

The Rotary Club has coöperated in educational work and has offered as a stimulus for better conditions in rural schools two attractive prizes. These prizes are awarded to the schools attaining the highest point of efficiency, as governed by the following requirements: vaccination, heating, ventilation, foundation, lighting, seats, water supply, water service, toilets, playground and attendance. During the 5-year period preceding the full time health department, there was an average of 218 deaths in the county as compared with an average of 189 annual deaths during the 5-year period of the full time department. Particularly noteworthy has been the reduction of deaths of infants under one year of age.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

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BRUNDAGE, D. K. Importance of Respiratory Diseases as a Cause of Disability Among Industrial Workers. Pub. Health Rep., 43:11 (Mar. 16), 1928.

Tonsillectomy and Respiratory Infections—Students of the University of Michigan who had had their tonsils removed had 40 per cent more acute respiratory infections than those who had not been favored with the surgeon's knife. The author concludes significantly: "The need for conservation in tonsillectomy was recently voiced by Canfield."

FORSYTHE, W. E. The Health Record of University Students as Related to Tonsillectomy. Pub. Health Rep., 43:10 (Mar. 9), 1928.

Physical and Mental Relationships—The nervous system tends to grow in obedience to inborn determiners and is very little influenced by malnutrition, pubescence, etc.

GESEL, A. Precocious Pubescence and Mental Growth. J. A. M. A., 90:11 (Mar. 17), 1928.

Malta Fever—The recommendation of the author is that all laboratories should perform agglutination tests for *B. melitensis* on all specimens submitted

for Widal test. In Iowa malta fever presents a health hazard comparable to that of typhoid.

HARDY, A. V. Malta Fever: A Problem for State and Municipal Laboratories. Pub. Health Rep., 43:9 (Mar. 2), 1928.

Differential Diagnosis—Smallpox, Chicken Pox—A useful summary of the points of differential diagnosis between smallpox and chicken pox, including distribution, appearance, development of lesions, and the history of the case.

LAIDLAW, F. W. Smallpox and Chicken pox—the Differential Diagnosis. New York State J. Med., 28:6 (Mar. 15), 1928.

Educating to Keep Fit—Health officials will be edified but not gratified to find the estimation of the value placed upon their services by this broad-visioned physician in his discussion of the need for educating people to keep fit. The author looks to Hollywood for a deliverer.

McKINNIE, L. H. The Business of Getting Well. J. A. M. A., 90:11 (Mar. 17), 1928.

Trachoma Prevention in the South—The extent of the infection throughout the southeast and southwest is summarized. Trachoma preventive measures act as an important influence in inaugurating full-time rural health administration.

MOSSMAN, P. D. Trachoma in the State's Health Program. Pub. Health Rep., 43:8 (Feb. 24), 1928.

Infant Mortality—There was a 29 per cent decrease in infant mortality during the decade 1915-1924 in the registration area. The greatest improvement occurred among colored infants in rural areas for whom the least is done under our various infant welfare schemes. During the same decade there

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Aerobic Flora of Colds—Green streptococci were found in all throats and Gram-negative cocci in most; frequently the influenza bacillus, pneumococcus, and diphtheroids were found. During "colds" foreign organisms appeared in some throats; in others the same organisms became dominant.

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PARRAN, T., JR. Venereal Disease Prevalence in Fourteen Communities. Ven. Dis. Inform., 9:2 (Feb. 20), 1928.

Tuberculosis Trends—Although tuberculosis mortality has been halved in Chicago during the present century, it has increased since 1922, due probably to the increase in the negro population. Under 11 years the rate in negroes is from ten to twenty times that of white children.

ROBEY, L., and FALK, I. S. A Statistical Study of the Mortality from Tuberculosis in the City of Chicago. J. Prev. Med., 2:2 (Mar.), 1928.

Physical Examinations for School Children—A consideration of the value of breath-holding and blood pressure tests in the examination of school boys.

SIMPSON, J. V. A. The Assessment of Physical Fitness. Med. Off., 39:9 (Mar. 3), 1928.

Venereal Disease Control Measures—Universal medical treatment that is adequate; follow-up that makes it effective; extended research; true ethi-

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Benzol Poisoning in Women—One of every three women exposed developed symptoms of benzol poisoning; young being more susceptible than old workers.

SMITH, A. R. Chronic Benzol Poisoning Among Women Industrial Workers: A Study of the Women Exposed to Benzol Fumes in Six Factories. J. Indust. Hyg., 10:3 (Mar.), 1928.

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STIMSON, P. M. The Earlier Diagnosis of Measles. J. A. M. A., 90:9 (Mar. 3), 1928.

Immunizing Against Pneumococci—Immunity was produced in rabbits by the injection of killed cultures or autolysate of pneumococci either into the buccal mucosa or other usual routes. The site to which the test dose of live pneumococci was applied had no effect.

STUPPY, G. W., and FALK, I. S. The Immunization of Rabbits Against Experimental Pneumococcus Infections. J. Prev. Med., 2:2 (Mar.), 1928.

Broad Tapeworm of Man Reported—The plerocercoid stage of the broad tapeworm of man has been demonstrated in several varieties of fish found in Lake Superior. The source presumably is the colonies of Scandinavian immigrants of that region.

VERGEER, T. *Diphylobothrium latum*, the Broad Tapeworm of Man. J. A. M. A., 90:9 (Mar. 3), 1928.

Sterilizing Milk Bottles—The more general use of individual milk bottles as serving containers leads to the question

of adequate chemical sterilization. Calcium hypochlorite solution even at 500 parts per million cannot be depended upon to kill human tubercle bacilli, but available chlorine of a strength of 95 parts per million will kill in three minutes.

WADE, E. M., et al. Chemical Sterilization of Milk Bottles in Relation to Tubercle Bacilli. *J. Bact.*, 15:3 (Mar.), 1928.

Diphtheria Bacillus Toxin Production—Diphtheria bacilli, having lost their toxin-producing characteristics when grown on certain synthetic culture media, failed to recover the characteristic when restored to ordinary media or when inoculated into animals. A synthetic, protein free medium is suggested which permits cultivation and toxin production.

WADSWORTH, A., and WHEELER, M. W. The

Attenuation and Toxin Production of the Diphtheria Bacillus. *J. Infect. Dis.*, 42:2 (Mar.), 1928.

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WARD, I. V. I. An Outbreak of Paratyphoid B Fever. *Lancet*, 1:8 (Feb. 25), 1928.

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DIABETES. ITS TREATMENT BY INSULIN AND DIET. A Handbook for the Patient. By Orlando H. Petty, M.D. (4th ed. rev.) Philadelphia: Davis, 1928. 155 pp. Price, \$2.00.

PROHIBITION: ITS INDUSTRIAL AND ECONOMIC ASPECTS. By Herman Feldman. New York: Appleton, 1927. 415 pp. Price, \$2.00.

LABORATORY MANUAL FOR GENERAL BIOLOGY AND FUNDAMENTAL EMBRYOLOGY. By John Giesen. (2d ed.) Milwaukee: Bruce Publishing Co., 1927. 215 pp. Price, \$1.80.

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THE EFFECT OF THE WORLD WAR ON EUROPEAN EDUCATION. By Fritz Kellerman. Cambridge: Harvard University Press, 1928. 89 pp. Price, \$1.00.

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HANDBOOK FOR THE MEDICAL SOLDIER. By Arnold Dwight Tuttle, Major, Medical Corps, U. S. A. New York: Wood, 1928. 691 pp. Price, \$5.00.

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SCHOOL POSTURE AND SEATING. By Henry Eastman Bennett. New York: Ginn, 1928. 323 pp. Price, \$2.00.

HEALTH RECORD FOR WOMEN. By J. Theron Hunter. Baltimore: Williams & Wilkins, 1928. 64 pp. Price, \$1.00.

THE PENNSYLVANIA ASSOCIATION OF DAIRY AND MILK INSPECTORS. Fourth Annual Report. Compiled by George C. Morris, Secretary-Treasurer. Harrisburg, Pa., 1928. 260 pp. Price, \$1.00.

NEWS FROM THE FIELD

SUMMER SCHOOL COURSES IN PUBLIC HEALTH

UNIVERSITIES and technical schools throughout the country are offering courses in public health and preventive medicine during their summer sessions. The following does not pretend to be a complete list of schools giving such courses this summer, but it represents the schools that replied to the circularization made by the *American Journal of Public Health* and *The Nation's Health* for the benefit of those readers who contemplate pursuing study in public health this summer.

UNIVERSITY OF CHICAGO, Chicago, Ill.

June 18-July 25 (First term)

July 25-August 31 (Second term)

Hygiene and Bacteriology

Public Hygiene. This will deal with problems of community hygiene such as water supply, sewage disposal, food supply, infant welfare, tuberculosis, insect-borne infections.

Immunity in Relation to Preventive Medicine

Public Health Problems

Sanitary Surveys

Public Health Nursing. Supervision in Public Health Nursing.

School Hygiene

Physical Education

COLUMBIA UNIVERSITY, DeLamar Institute of Public Health, College of Physicians and Surgeons, New York, N. Y. July 9-August 17.

School Health Inspection

Administration of Health Work in Schools

Organization and Supervision of Health Education

Teaching of Health in Secondary Schools and Colleges

Health Care of Children

Research in Child Health

Physical Education

Nutrition in Health Education

Mental Hygiene

Public Health Nursing

School Nursing

Nursing Supervision in Clinics and Out-Patient Departments

Sanitary Science

Industrial Medicine

Public Health Administration

Bacteriology

Public Health Engineering

CORNELL UNIVERSITY, Ithaca, N. Y. Opening July 3.

Physical Education. Course in the organization, administration and methods of teaching physical education.

Measurements of School Children. This course will stress the practical application to problems of growth and development.

Hygiene of the School Child and Adolescent

Health Inspection of School Children

This course is planned to familiarize teachers with facts and methods necessary for making an effective health inspection of school children.

HARVARD UNIVERSITY, Cambridge, Mass. July 2-August 11.

Principles and Problems of Hygiene. This will emphasize disease prevention and also the interpretation and organization of material in hygiene for instruction and application.

Physical Education

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge, Mass. July 2-August 14

Methods of Teaching General Biology
Bacteriology

Health Education Methods

Hygiene of School Child

Public Health Laboratory Methods

Public Health Institutes for Health

Officers and Public Health Workers

MICHIGAN STATE COLLEGE, East Lansing, Mich. June 18-July 27.

Medical Biology. This course is designed for persons trained in hospital and public health laboratory procedure.

Bacteriology

Hygiene

UNIVERSITY OF MICHIGAN, Ann Arbor, Mich. June 25-August 17

General Hygiene and Public Health
School Hygiene

Methods and Materials in Health
Education

Public Health Nursing, Principles and
Administration

Public Health Institutes will be held each Friday and Saturday throughout the six weeks of the summer session for intensified study in public health work.

UNIVERSITY OF MISSOURI, Columbia, Mo. June 7-August 3

Physical Education

Nursing

UNIVERSITY OF NEW MEXICO, Albuquerque, N. M.

The Elements of School Health. This course of 16 lectures will be given by members of the staff of the New Mexico Bureau of Public Health.

NEW YORK UNIVERSITY, New York, N. Y. July 9-August 17.

Education in Health. This course is designed for superintendents, principals, teachers, and others responsible for health instruction and supervision in schools.

Health of School Children

NORTHWESTERN UNIVERSITY, Evanston, Ill.

Physical Education and Hygiene for
Public Schools

OREGON STATE AGRICULTURAL SCHOOL, Corvallis, Ore. June 18-July 27.

Methods of Health Education

Problems in Nutrition

Child Care Nursing

Physical Education

Home Economics

PENNSYLVANIA SCHOOL OF SOCIAL AND HEALTH WORK, Philadelphia, Pa.

Public Health Nursing

Public Hygiene and Sanitation. These courses will be given under the direction of the Department of Public Health Nursing.

UNIVERSITY OF PENNSYLVANIA, Philadelphia, Pa. July 2-August 11

Hygiene and Physical Education

UNIVERSITY OF ROCHESTER, Rochester, N. Y. June 27-August 3

Mental Hygiene of Childhood and
Adolescence

Methods in Health Education. This course also includes devices for the development of child health habits and is designed for classroom teachers, physical education directors and school nurses.

STANFORD UNIVERSITY, Palo Alto, Calif. June 21-September 1.

Public Health Nursing

Health Department Administration.

This will consist of lectures on the activities, organization and powers of public health departments, supplemented by laboratory work and work in the field.

Physical Education and Hygiene

UNIVERSITY OF WASHINGTON, Seattle Wash.

June 12-July 17 (First term)

July 18-August 22 (Second term)

Principles of Physical Education.

Physical Education Administration.

Nutrition

Bacteriology

Principles of Public Health Nursing
and Administration

The Health Education Movement. This course is planned for school administrators and classroom teachers

in elementary and secondary schools and for school nurses.

WESTERN RESERVE UNIVERSITY, School of Applied Social Sciences, Cleveland, O. June 18-July 27.

Principles and Practices of Public Health Nursing
Health Education
Psychiatry

UNIVERSITY OF WEST VIRGINIA, Morgantown, W. Va.

Hygiene and Sanitation

UNIVERSITY OF WISCONSIN, Madison, Wis.

June 25-August 3.

School Hygiene and Health Teaching.

This course is arranged especially for principals, superintendents and directors of health education.

Supervision and Organization of Health Education. This course is for those who will give courses in health education, in their own teaching institutions.

Bacteriology (As related to sanitary problems)

Public Health. Lectures and field work for medical students.

CALIFORNIA PUBLIC HEALTH NURSES INSTITUTE

THE annual Institute for Public Health Nurses will be held under the joint auspices of the Summer Session of the University of California and the State Department of Public Health, at Berkeley and Los Angeles. The Berkeley institute will be held July 9 to 20; and the institute at Los Angeles will be held July 23 to August 3, inclusive.

CLINICAL THERMOMETERS

THERE was a conference of manufacturers, distributors and organized users of clinical thermometers on March 30, at the Department of Commerce in Washington, D. C. At this conference a standard for the minimum requirements in manufacturing clinical thermometers was adopted, which will be effective on October 1, 1928, and which allows one year—until March 30, 1929, for the clearance of existing stocks. These standards will be revised annually.

PUBLIC PLAYGROUNDS

THE Harmon Foundation has granted \$40,000 for the development during 1928, of permanent public playgrounds in new residential developments. The awards will be directed by the Play-

ground and Recreation Association of America, New York, N. Y.

SAFETY EDUCATION

A graduate fellowship of \$1,000 at Teachers' College, Columbia University, for the year 1928-1929 is offered by the National Bureau of Casualty and Surety Underwriters for work on constructing a course of study in Safety Education for Secondary Schools.

ARIZONA HEALTH CONFERENCE

A PUBLIC Health and Sanitary Conference at the University of Arizona, Tucson, arranged by the State Board of Health, was held April 17 and 18. The program included milk inspection and analysis, public water supplies, municipal and rural sewage and garbage disposal, and other public health topics.

BEST BOOK FOR PARENTS

DOUGLAS A. Thom, M.D., Director, Division of Mental Hygiene, Massachusetts Department of Mental Diseases, has been awarded the medal for the best book for parents published during 1927. The medal, which is presented by *Children, The Magazine for Parents*, was awarded for Dr. Thom's book, *Everyday Problems of the Everyday Child*.

THE LABORATORY

A new publication is issued by the Technical Service Department of the Fisher Scientific Co., Pittsburgh, Pa. *The Laboratory* is issued for "those interested in keeping informed on the latest developments of laboratory apparatus and technic." The initial issue carries a description of several new laboratory apparatuses, recently put on the market.

TUBERCULOSIS ERADICATION IN CATTLE

A tabulated summary just issued by the Bureau of Animal Industry, U. S. Department of Agriculture, shows the progress of tuberculosis eradication work in coöperation with the various states. Nearly three-fourths of the number of cattle are in herds which have successfully passed one or more tuberculin tests.

More than 2 million cattle are accredited as free from tuberculosis, as the result of a series of tests. As the result of systematic testing, bovine tuberculosis in the United States is gradually being reduced.

MEDICAL PROGRESS

THE American Association for Medical Progress has published the first issue of a new publication, which will be issued quarterly. This is *Medical Progress*. Benjamin C. Gruenberg, is Editor, and articles have been contributed by Dr. Gladys H. Dick of the John McCormick Institute for Infectious Diseases; James E. Peabody of the United States Congress. Dr. Gruenberg has contributed notes on the commemoration of the four great scientists, whose centenaries are being celebrated this year—Von Baer, Hunter, Harvey and Malpighi. News notes and items of interest are included, which will interest laboratory workers and health officers throughout the country.

ANOTHER SACRIFICE TO SCIENCE

THE most recent worker to lose his life from Rocky Mountain spotted fever is A. Leroy Kerlee, who was employed in the U. S. Public Health Service laboratory at Hamilton, Mont., as a bacteriologist. This disease has caused the death of 4 workers, who contracted it in connection with their researches in the course of official duty. The others are Dr. T. B. McClintic, W. E. Gettinger and G. H. Cowan.

CALIFORNIA HEALTH INSTITUTE

THE Northern California Public Health Association will hold a Public Health Institute in San Francisco, May 28 to June 8, inclusive. The institute will be conducted by Dr. Haven Emerson, Professor of Public Health Administration, Columbia University, New York, N. Y.

VETERAN OF YELLOW FEVER CAMPAIGN

ANOTHER survivor of the yellow fever experiments conducted by Walter Reed and his associates in the U. S. Army in Cuba in 1901 has been found. He is James Hildebrand, of Atlanta, Ga., and is 73 years of age, and almost entirely incapacitated by tuberculosis. The medical board at Gainesville, Ga., gave him a pension as a Spanish War Veteran of \$50 a month, on which he and his widowed sister live.

Recently in Congress, the Copeland-Wainwright bill was introduced to provide for these survivors or their dependents, regardless of their military rank or civilian status.

REGISTRATION AREA DRIVE IN TEXAS

IN the special drive being made by Dr. J. C. Anderson, state health officer, to bring Texas in the vital statistics registration area, each justice of the peace throughout the state has been asked to act as local registrar in his own precinct.

PERSONALS

DR. JAMES W. LOUGHLIN has been appointed health officer of the third district with headquarters at New-castle, Me., to succeed Dr. George E. Parsons, who has resigned to enter practice at Millinocket, Me.

WALTER D. THURBER has resigned because of ill health as executive secretary of the Maine Public Health Association, after 7 years' service, and has moved to California.

DR. PAUL PREBLE has been loaned by the U. S. Public Health Service to the Maryland State Department of Health to take charge of the Bureau of Vital Statistics pending the selection of a physician to that position; Dr. Preble will continue his work at the Johns Hopkins School of Hygiene and Public Health while with the State Department of Health.

DR. GEORGE G. EITEL bequeathed to the University of Minnesota \$80,000 to provide a fund for needy medical students and a loan scholarship.

DR. FERDINAND C. HELWIG has been appointed full-time pathologist to St. Luke's Hospital, Kansas City, Mo.

DR. LOUIS J. WOLFORD, St. Louis, has been appointed to the Missouri Nurse Examiners Board by the governor to succeed the late Dr. Edward W. Saunders.

DR. JESSE A. KING, Ojai, Calif., has been appointed health officer of Ventura County to succeed Dr. Adolph A. Maulhardt.

DR. EDWIN O. PALMER has been appointed superintendent and business manager of the Hollywood Hospital, Los Angeles, Calif.

DR. FRANK E. McCULLOUGH has been appointed city health officer of North Sacramento, Calif., to succeed Dr. Archibald A. Atkinson.

DR. CHARLES O. PROBST, Columbus, O., has been appointed medical director

of the Franklin County Tuberculosis Sanatorium, succeeding Dr. Stephen Douglass, resigned.

HEALTH DEPARTMENTS of Hamilton and Butler Counties, O., have combined with Dr. Clifford J. Baldridge as health officer.

DR. WM. M. HARDY, assistant secretary of the state medical association, has been elected city health officer of Nashville, Tenn.

DR. HUGH W. WILLIAMS has been elected health officer of Sparta, Wis., to succeed the late Dr. Vernon W. Stiles.

DR. GUSTAVE WINDESHEIM of Kenosha, Wis., has been elected president of the State Board of Health to succeed Dr. Otho A. Fiedler whose term expired.

DR. THOMAS J. CHARLTON has been appointed to succeed Dr. Craig Barrow as physician-in-charge of the Georgia Infirmary, Savannah, Ga.

DR. GUY G. LUNSFORD, Weston, Ga., has been appointed health officer for Crisp County.

COL. ALBERT A. SPRAGUE has accepted the chairmanship for the Chicago division of the Leonard Wood Memorial for the Eradication of Leprosy.

DR. LANG A. MITCHELL has been appointed county health officer of Payne, Okla.

DR. PETER PAUL BARRON has been appointed health officer of the city of Dorris, Calif. to succeed Dr. Sanford W. Cartwright.

COL. BAILEY K. ASHFORD, medical corps, U. S. Army, has been appointed by the government of Porto Rico as its representative in the International Congress of Tropical Medicine and Hygiene to be held at Cairo, Egypt, December 28.

DR. GEORGE D. HEATH, JR., has been appointed health commissioner of the city of Bloomington, Ill.

GEORGE A. COLLINS has resigned as health officer of Denver, Colo.

DR. F. BOWMAN, formerly epidemiologist for the Wisconsin State Board of Health, has been appointed health officer for Madison, Wis.

DR. FREDERICK C. ANNABEL, health officer of the town of Elmira, Chemung County, N. Y., for twenty years, died on March 10 from pneumonia.

DR. C. R. BOWEN, health officer of the consolidated health districts of Almond and Alfred in Allegany County, N. Y., died February 27 of heart disease. The fact that he served as health officer of Almond for many years prior to 1904 places him as one of the oldest health officers in point of service.

MILDRED G. SMITH, R.N., formerly Educational Agent of the Minnesota State Department of Health, has been appointed Staff Associate of the National Society for the Prevention of Blindness, with headquarters in New York, N. Y.

DR. J. P. BAKER died at Findlay, O., on February 14. He was an outstanding figure in public health work, and was a member of the board of directors of the Ohio Public Health Association, and president of the Board of Health of Findlay.

DWIGHT S. ANDERSON, publicity assistant, National Tuberculosis Association, has joined the staff of Will, Folsome and Smith, hospital financial directors.

LOUISE FRANKLIN BACHE, formerly of the Syracuse Department of Health and Syracuse Community Chest, is now director of publicity of the National Probation Association.

DR. CHARLES BOLDUAN has been appointed director of the Department of Public Health Education, New York City Department of Health.


AROLD R. HANCE is staff artist of the Michigan Tuberculosis Association.

POSITIONS WANTED


Services of thoroughly qualified graduate sanitarian soon will be available. Experienced in state and municipal public health work, housing, sewerage and sewage disposal, social surveys, municipal waste collection and disposal, sanitary inspections, reports, investigations, etc. Excellent at organization and administration. Let's get together and talk it over. Address 50 W. F.

GRADUATE CIVIL AND SANITARY ENGINEER desires change. Two years as assistant and five years as chief engineer of State Health Department. Also teaching experience in recognized engineering school. Age 31, married. Will consider any kind of responsible employment including teaching sanitary engineering subjects. References furnished upon request. Address 51 F. P.

DIRECTOR OF LARGE PUBLIC HEALTH LABORATORY desires change of position. College graduate. Has organizing and administration ability. Trained and experienced in all forms of laboratory procedure. Address 52 M. C.



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American Journal of Public Health

and THE NATION'S HEALTH VOL. X NO. 6

Volume XVIII

June, 1928

Number 6

Responsibility of Government in Public Health Work*

E. L. BISHOP, M. D., FELLOW A. P. H. A.

State Health Commissioner, Nashville, Tenn.

REASONING primarily from an economic point of view, it can be shown that the human element is the only variable in the equation producing the sum total of a nation's wealth. The total quantity of coal, iron, water power, soil fertility and other natural or physical resources remain essentially the same unless modified by man. Man's ability to convert these resources into products capable of serving humanity largely determines the sum of usable wealth. Man's ability to work therefore, is the variable directly influencing the economic welfare of a community, state or nation. Man's health directly and radically influences his ability to work and produce.

Disease ridden communities are usually poverty stricken communities, which concern not only the communities themselves but the state and nation in which they are found. Can there be a more fundamental responsibility of government, considered from an economic standpoint alone, than the responsibility to serve and protect the public health? If it be granted that we have the responsibility, how may it best be discharged? Certainly there must be an organization to act as the agency of government in fulfilling this responsibility just as other governmental organizations act in fulfillment of their governmental responsibilities. Moreover, organization for health work must follow the lines of governmental organization.

The three elements of government in America are federal, state and local. Each unit of government should discharge that part of the

* Read before the Health Officers Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 18, 1927.

responsibility which its opportunities and station in the whole scheme of government especially qualifies it to fulfil.

Public health administrators have, in recent years, come to a definite realization of this principle. For many years the federal government has efficiently performed its function, or at least a part of its function, and states have gradually developed efficient organizations. Within quite recent years, we have found it impossible to succeed unless we develop local health organizations. The South, incidentally, has led the way in this latter development by placement of a major emphasis on full-time local health departments.

The influence of the U. S. Public Health Service is indispensable in this country, (1) as an agency dealing with foreign and interstate problems, (2) as a coördinating influence, (3) a research body, and (4) a stimulant to the development of health activity by state governments. In addition, it has a fifth and vital responsibility to deliver expert consultant service to state health organizations, much as the state gives similar service to its local governments.

A state health department, being one degree nearer the individual citizen, has greater authority than any other jurisdiction and a more intimate relation to local health departments than the federal government. It may utilize the police powers of the state to assist in discharging its responsibilities. Even here, economic administration demands that the state health organization should, though holding central authority, delegate the fullest possible authority to local health organizations in handling local affairs. The state has a double function in the discharge of its responsibility: First, it must act as a stimulant and a coördinating agency in the development and in the work of local health departments whether county or municipal. Second, with the development of a sound local health organization, the state department must maintain a service for consultation and for supervisory activity in connection with the programs of the local health departments.

The local health department is that agency through which government delivers adequate health service to the community. Preventive medicine is an activity concerned with the individual and the community. The federal government cannot maintain an organization reaching every individual and protecting every community with adequate service. Not only would such an organization fail; but in this country of local self government such a situation would not, and should not be tolerated. It is but slightly less absurd to expect a state health organization to render direct health service to each individual community. We expect this of no other state department.

Reasoning, then from this point of view, it would seem that one of

the most important and one of the most immediate responsibilities of government in protection of public health is that of providing at the earliest possible time for wide extension in the development of reasonably adequate local health service, that the direct health service so essential in the protection of public health may be rendered in the proper measure. Unless this is done, neither the federal nor state departments can function effectively and neither can give that measure of service to the nation or the commonwealth that it should give, for there will be no local agency through which it may reach the individual citizen. Hence, both the federal and state governments should concern themselves immediately with preparation for the expansion of local health service. To the extent that they fail in so directing their activity, they fail in fulfilling their major responsibility.

Municipal health organization while yet far from ideal has progressed much more satisfactorily than has rural health organization, due to the urgency of health problems and the concentration of wealth which makes purchase of health service possible.

Rural health organization is confronted by two major problems, the first being the difficulties of financing, and the second that of securing properly trained personnel. Preventive medicine is a specialty of medicine requiring greater special training than the other medical specialties, for it draws upon the whole sum of human knowledge, the natural as well as the medical sciences. With increased demand, however, an increase in trained personnel will take place and this difficulty will be lessened.

Reasonably adequate health service through local health organization is wholly beyond the purchasing power of many local units of government. In the East where there is a high concentration of wealth, this is due to the smallness of the unit of local government. Here it can and will be solved by uniting townships into county or district health departments. In the South, where the county is the basic unit of local government, it may be generations before some counties have it within their power to buy a reasonably adequate health service.

Consider the problem of a county with a population of 2,600 and an income of less than \$15,000.00 per annum—How may such a county buy health protection? The citizens of this county have as much right to expect protection as have the citizens of a county with an income of a million or more. It is the responsibility of the federal and state governments to develop a type of health organization that will meet these economic difficulties, and some progress is being made to that end.

The county health unit or county health department is applicable to a fraction of our southern counties, and to combinations of town-

ships in other sections of the country. Another solution must of necessity be found for some of our southern counties. Various ideas have been proposed. It is well recognized now that the state should coöperate financially with the county, at least during the early history of the county health department. It is the usual thing for the state department of health to provide one-half of the budget for the first year's operation, the funds for this appropriation being derived primarily from state appropriations, but also from federal appropriations and commitments by other agencies. In point of fact both the state and federal governments should participate permanently in the budget of the local health department, since such a procedure accomplishes several quite desirable purposes.

In the first place an equitable taxing system has never yet been devised. Concentration of wealth into urban areas penalizes rural areas, yet rural health problems are complex and more expensive to administer per capita than urban health problems. Hence, distribution of the financial burden is justifiable for the rural area, the state and nation being either directly or indirectly benefitted by well organized local health work.

In addition to this objective, the coöperation of all three elements of government in carrying out the local health program makes for a coördination of health activity the country over. The knowledge of one service becomes the property of all services; elements in the program of one service become parts of the activity of other services. Still another most desirable objective which may be achieved through this coöperation is the stabilization of local organization. The county health department has proved itself as an element in our scheme of public health administration and it is very desirable for the three elements of government to participate in the development and expansion of local health service.

Southern state governments are rapidly assuming this responsibility. The federal government has not yet developed the degree of coöperative activity with states in this respect that it should develop. The total appropriation for this purpose to the U. S. Public Health Service is \$85,000.00 per annum. Tennessee has appropriated exactly this amount per annum for the current biennium, yet Tennessee has only begun the development of its local health program.

As has been indicated, some other method than the county health department must be found to serve the needs of smaller and poorer counties. Some authorities have advised increased subsidies from the state and perhaps federal appropriations. Others have suggested district health organizations, and it has even been said that in extreme

instances the state should assume the entire cost. The latter proposal is entirely unsound from the standpoint of administrative practice. It would do no more than teach the community dependency. It is probable that the final solution will come through a combination of the suggestions involving combinations of local governments and increased subsidies from the state. Certainly this seems to be the more sound and promising point of view. The principles involved have ample precedent both for the federal and state governments in provisions that have been made for the development of educational activity, for the improvement of agriculture, and for the construction of roads. Certainly no one can dispute the fact that the welfare of one community affects the welfare of other communities. It is equally true that the welfare of the country is but the sum of the welfare of its communities and therefore state and federal governments have a definite responsibility in the welfare of every community.

SUMMARY

The federal government should protect the nation from menace from without; should stimulate the states to an efficient state health organization; should serve the states through the rendition of expert consultant service; should deal with matters involving state relations, one with the other; and should coöperate through the state governments in the development of local health organization, especially during the formative stage of this activity.

The state government should protect itself against danger from without in so far as it may; should stimulate and assist local governments in the development of efficient whole-time health work; should give expert consultant service to the local health departments; and serve as a coördinating agent in the development of local health programs by welding these programs into one for the state as a whole.

The local health department should render that measure of direct service to the community which is required for protection against diseases and for the promotion of health. It should demand of its state government that the state render service which it can and should be expected to provide. For example, a small health department needs no sanitary engineer, yet has occasional problems involving such service; it needs no expertly trained epidemiologist, yet not infrequently requires the services of such a person for a short period of time. All three elements of government must concern themselves with research either in the field or in the laboratory, that better methods may be evolved and that knowledge of the causes and conditions of both health and disease increase both in extent and practical application.

Thermal Death Point of Streptococci*

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THE investigations forming the basis of this paper were undertaken because of the expressed wish of some of the members of the Association that a larger number of strains of pathogenic streptococci from varied sources be tested as to their thermal death point at 30 minutes' exposure, before a final decision be made as to the proper temperature necessary for commercial pasteurization.

In order that we may have fresh in mind the previous work on streptococci let us summarize the results of the rather recent elaborate investigation by Ayers.

In 1918, Ayers¹ studied a number of streptococci as to their thermal death point. Cultures of 5 were completely killed after an exposure of 30 minutes to a temperature of 140°, 12 at 135°, 5 at 130°, and 5 at 125° F. He also tested 6 non-hemolytic varieties of streptococci derived from pus from the pleura, scrotum, elbow joint or the blood. These were not killed when exposed for 30 minutes to 140° F. They required heating to temperatures as high as between 55° and 60° C. These are varieties, however, which are not known to have been communicated through milk to man. From Ayers and Johnson we also have the knowledge that among streptococci obtained from the cow resistant strains of streptococci are found. Forty-six of 139 such strains required an exposure of 30 minutes to temperatures of 71.1° C. (160° F.) to 73.9° C. (165° F.) to cause their death. These streptococci, however, so far as known, are not pathogenic to man.

Summing up the results of these investigations we find a small portion of the strains of hemolytic streptococci which may be transmitted by milk and are pathogenic to man, are more resistant than the majority and withstand heating to a temperature of 135° F. for 30 minutes, but not one to a temperature of 140° F. for 30 minutes. The remainder are killed at temperatures ranging from 125° to 135° F.

We now turn to the present investigations, the object of which is, if possible, to satisfy ourselves, by testing the thermal death point of a large number of hemolytic streptococci obtained from human infections, what degree of temperature is sufficient to destroy the most

* Read at a Special Session on Milk of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 18, 1927.

resistant in 30 minutes. Our present information leads us to believe that the diseases shown to have been transmitted through milk by means of streptococci have always been due to the hemolytic varieties.

The few non-hemolytic strains believed to have caused occasional human infections, have been through the taking of food products such as cheese. These so-called "green" streptococci would require much higher temperatures or much longer exposures, so that from the point of view of pasteurization it would be impracticable to safeguard against them, unless they were a very real danger. The streptococci utilized in our tests were 100 strains obtained from the following sources:

Source of Strains	Number of Strains
Cases of	Tested
Septic Sore Throat	20
Tonsillitis	20
Scarlet Fever	18
Mastoiditis	9
Glandular fever	7
Erysipelas	18
Other sources	8
	<hr/>
Total hemolytic strains	100

METHODS USED IN TESTING THE THERMAL DEATH POINT

The First Method was to fill vials with about 10 c.c. of sterile milk and place them in a water bath, the water of which was somewhat higher than the desired temperature. Then the milk in the vials and the water in the water bath having reached the desired temperature, 0.05 c.c. of a blood broth culture of the strain of streptococcus to be tested was injected into the milk and the vial stopped by a rubber cork already heated to the same temperature. The stoppered bottle was then submerged in the heated water for the required times. It was then removed and the contents immediately cooled by pouring the contents into an ice-cold 100 c.c. bottle which was immediately packed for a few minutes in cracked ice. The bottle with its contents was then removed and placed in the incubator at 37.5° C. for approximately 42 hours. The milk in the vial was then tested for viable hemolytic streptococci on blood agar plates.

The individual strains were also tested in a slightly different way by filling the bottles with water and covering them while submerged with softened parchment. This made it possible to be certain that no air pocket was present. The culture of streptococci was injected after piercing the parchment with the needle of the syringe holding the culture.

The Second Method approached the actual pasteurizing process—250 c.c. of milk held in a bottle at the desired temperature was inocu-

lated, and then after a moment's shaking discharged into a funnel heated to the same degree, and through this into a lead coil submerged in water held at the desired temperature. At the proper time the submerged outlet of the coil was raised, the metal stopper removed, and a sample taken. The end was then plugged, plunged in boiling water, and dropped back until the next sample was taken. For this method a large number of strains were mixed together.

Further—through the kind coöperation of Dr. Bundesen—Dr. Tonney, Assistant Commissioner and Director of the Chicago Department of Health Laboratories, subjected 100 strains of hemolytic streptococci derived from similar cases in Chicago to tests carried out by the method of the submerged vials. The results of these tests will be given first.

Thermal death point in milk of 100 strains of hemolytic streptococci exposed at 20 and 30 minutes as reported by Dr. Tonney were as follows:

Sixty strains (sources—milk 10, epidemic sore throat 1, ears and throats of scarlet fever patients 10, throats from cases of contagious diseases 38, and University of Chicago Laboratory 2) were killed after an exposure of 30 minutes to 135° F. Of the remaining 40, there were 2 killed by an exposure to 138° F. for 30 minutes and 38 were killed after exposure to 140° F. for 30 minutes, but probably not killed after exposure of 20 minutes.

The sources of the more resistant 38 strains were—milk 4, epidemic sore throat 1, University of Chicago 1, contagious disease wards 32.

Dr. Tonney wrote me that he did not test the milk in the vials for hemolytic streptococci that seemed to have a growth after 10 and 20 minutes' exposure as his interest was mainly in the 30 minutes' exposure. As some of those which were exposed to 140° for 30 minutes and showed growth in the milk on testing were found to have no living hemolytic streptococci, it is probable that if the milk in the vials heated for 10 to 20 minutes had been tested, the growth might have been shown to be due to other bacteria.

Results obtained in New York City Laboratories were as follows:

Cultures of streptococci from every one of the 100 strains were killed after 10 minutes' exposure to 140° and after 30 minutes' exposure to 138° F. Thirty combined cultures in milk when passed through the lead coil were killed after 30 minutes' exposure at 136° or 20 minutes at 138° or 10 minutes at 140° F. The destruction of most of the streptococci was surprisingly rapid when heated to 138° F. in milk.

Thus, 25 mixed cultures of erysipelas strains added to milk, so that 1 c.c. contained about 10,000,000 streptococci showed no growth after

5 minutes' exposure, either in blood plates immediately inoculated with 1 c.c. or in plates inoculated from 3 c.c. of milk after 42 hours of incubation.

PATHOGENIC NON-HEMOLYTIC STRAINS OF STREPTOCOCCI

In the issue of August 6, 1926, of the *Public Health Reports*, Linden, Turner, and Thom report two outbreaks of food poisoning due to the eating of cheese. In all, 31 persons suffered from an attack of pains in stomach, nausea and diarrhea. Samples of the two lots of cheese showed enormous number of bacteria. These were mostly short non-hemolytic streptococci. Milk cultures of these streptococci caused illness when fed to cats.

They report that of 3,500,000 of these organisms subjected to 143° F. for 30 minutes, 6,100 survived, but that of 1,000,000 exposed to 145° F. for 30 minutes none survived. In our tests they have been more resistant.

In our laboratory Miss Oldenbusch subjected the culture to temperatures of 143° and 145° F. with the following results:

TIME OF EXPOSURE	AT	143° F.	145° F.
		Streptococci in 1 c.c.	
30 minutes		4,000,000	2,500,000
45 "		1,950,000	450,000
60 "		1,440,000	48,000
75 "		14,000	700
90 "		900	0

The infected milk before heating when plated developed about 40,000,000 colonies per c.c.

There are at least two important reasons why the existence of these heat resistant non-hemolytic streptococci have little or no bearing on the question of the proper temperature to be used in the pasteurization of milk. The first is that no outbreak of milk infection has been traced to them, the second that the temperature required to kill them is so great that it would damage the taste and appearance of the milk to a degree which would make it much less desirable as a food.

I believe no one would suggest that pasteurization of milk be carried on for 90 minutes at a temperature of 147° to 148° F.—the two degrees being necessary as a margin of safety.

THERMAL DEATH POINT OF BRUCELLA ABORTUS

The importance of infections with this microorganism having been so recently appreciated, little work has been reported upon its resistance to heat. The results of the following experiment are given so as to complete the study of the thermal death point of pathogenic bacteria transmitted through milk. These tests were carried out in the New York City Department of Health Laboratory by Carolyn Oldenbusch.

Sterile milk was bottled in 9 c.c. amounts and heated to a temperature of 1° C. above test temperature. One c.c. of a suspension of 13 strains of *B. melitensis* and *B. abortus* (of human, bovine and swine origin) was added to each bottle which was then submerged in a water bath at the appropriate temperatures, for the desired length of time.

On removing from the water bath, bottles were plunged into cracked ice and quickly and thoroughly chilled. Four plates were then made from the milk, and again after the milk had been incubated for 48 hours at 37° C. Controls showed there were 5,000 billion organisms per c.c. of milk.

At 140° F. the cultures survived $7\frac{1}{2}$ minutes, but were killed at 10 minutes. At 142° F. they survived 5 minutes and were dead at $7\frac{1}{2}$ minutes, while at 145° F. the milk was sterile at the end of 5 minutes' heating.

SUMMARY

Two hundred strains of hemolytic streptococci obtained from different cases of septic sore throat, scarlet fever, erysipelas and other diseases known to be due to hemolytic streptococci and transmitted at times through milk were tested as to their thermal death point while in milk after 30 minutes' exposure.

One-half of these were examined in the laboratories of the Chicago Department of Health under the direction of Dr. Tonney and one-half in the laboratories of the New York City Department of Health.

Cultures from every one of the 200 strains were killed by an exposure to 140° F. for 30 minutes. The majority of strains were killed at a temperature of 136° F. or less.

The resistant, probably pathogenic, non-hemolytic streptococcus found in cheese was not killed after 75 minutes' exposure to 145° F. but was killed after 90 minutes.

Cultures of *B. melitensis* and *B. abortus* were killed after 10 minutes' exposure at 140° F.

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Progress in the Control of Pollution by Industrial Wastes*

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IN 1916, the Committee on Sanitary Control of Waterways presented a report¹ dealing with the fundamental principles involved in the sanitary disposal of sewage and industrial wastes and recommending a "Code of Regulations for the Sanitary Control of Waterways." Subsequently that committee presented a "Bibliography on Industrial Wastes," but this was not published. No further reports have been made by that committee which has now been consolidated with the Committee on Sewerage and Sewage Disposal and Committee on Sludge Disposal to form the Committee on Disposal of Sewage and Industrial Wastes. As a member of the new committee, the writer has been requested to present a paper on progress in the control of pollution by industrial wastes.

Lines of Progress in Control of Pollution—Considerable progress has been made in recent years in the control of pollution by industrial wastes. This progress has been along several different lines including discussion, investigation, coöperation, litigation and legislation. Some of the more important developments along these lines are outlined in this paper.

Papers and Symposia on Industrial Wastes—Numerous papers on different phases of the industrial wastes disposal problem have been published in society journals or proceedings and in the technical press. Symposia on industrial wastes have been held at meetings of various technical societies including the American Chemical Society, American Institute of Chemical Engineers, American Water Works Association and American Society of Civil Engineers. The subject was also discussed at the International Conference on Sanitary Engineering in London in 1924.

At the meeting of the National Health Congress at Atlantic City, N. J., in May, 1926, a session on domestic and industrial wastes in relation to water supply was held under the joint auspices of the Public

* Presented to the Public Health Engineering Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 20, 1927.

Health Administration Section and the Public Health Engineering Section of the American Public Health Association and the New Jersey Sanitary Association. At this session, papers were presented by eminent authorities on administrative problems, legal principles involved, and solutions of the problem of control of industrial wastes pollution. These papers, together with discussions of the same were published in the *American Journal of Public Health*.²

Reports of American Water Works Association Committee on Industrial Wastes in Relation to Water Supply—Industrial wastes in relation to water supply has been the subject of investigation by a committee of the American Water Works Association, which has made four progress reports.³⁻⁶

Monograph by Legislative Reference Service—A monograph on the Pollution and Obstruction of Navigable Streams in the United States by Sewage and Industrial Wastes has recently been prepared by George J. Schulz of the Legislative Reference Service of the Library of Congress.⁷

A large part of this monograph is devoted to the subject of treatment of industrial wastes. Several different kinds of wastes are dealt with and the importance of recovery and utilization of valuable by-products is stressed.

Control by State Boards of Health—The control of stream pollution in the United States has been vested very largely in the state boards of health, although information obtained in 1921 by the American Water Works Association Committee⁸ showed only 5 states where the authority was ample in all respects, and in nearly all cases enforcement of the laws was materially hampered by insufficient appropriation for adequate field and laboratory forces. Since that time, state boards of health in general have been strengthened in these respects and have become more active in the matter of stream pollution control. The International Health Board of the Rockefeller Foundation⁹ reports that whereas in 1915 only 18 state boards of health in the United States had divisions of sanitary engineering, at the close of 1926 all but 4 states had established such divisions.

Pennsylvania Sanitary Water Board—State authorities, other than boards of health, which have had to do with stream pollution control, include commissions on fisheries, boards of conservation and special boards. In Pennsylvania, the control of stream pollution is vested in the Sanitary Water Board created in 1923 for the purpose of coördinating the duties and authority of various branches of the state government and composed of the Secretary of Health, the Secretary of Forests and Waters, the Commissioner of Fisheries, the Chairman of

the Public Service Commission and the Attorney General.* This board has created an Industrial Wastes Section to give particular attention to the problem of control of pollution by industrial wastes.

Classification and Zoning of Streams—The Sanitary Water Board of Pennsylvania has undertaken to classify the streams of the state with a view of maintaining in good condition those (Class A) that are still satisfactory for water supply after chlorination only; controlling or eliminating pollution on certain other streams (Class B) for the protection of public health and animal and aquatic life and use for recreational purposes; and of permitting the discharge of sewage and industrial wastes into certain streams already polluted (Class C) provided such discharge will not create a public nuisance or menace to health. In Ohio also provision has been made for the zoning of the waters of the state.

The Ohio Stream Pollution Act of 1925—Most state boards of health have incomplete authority over pollution by industrial wastes. The Ohio State Department of Health is an exception to the rule. An act passed by the General Assembly in 1925 provided, among other things, for the approval of the State Department of Health of any new or increased discharge of industrial wastes, for general supervision by the department, of the operation and maintenance of industrial wastes treatment plants, and for the adoption by the department of such regulations as may be necessary for preventing undue pollution of streams.

Interstate Agreements—There is no general provision in this country for the control of pollution of interstate streams as in the case of the rivers boards in Great Britain and the drainage districts in Germany.¹⁹ Mutual agreements with respect to the policy of controlling pollution of interstate streams have been made by the health departments of certain states including Pennsylvania and New Jersey; Pennsylvania, Ohio, West Virginia, Kentucky, New York, Maryland, Indiana, Illinois and Tennessee; and Ohio and Michigan. These interstate agreements have proved very beneficial in the control of pollution by industrial wastes.

Coöperation with Industry—The Sanitary Water Board of Pennsylvania adopted the principle of coöperating with industry in the solution of industrial wastes disposal problems. An agreement between the board and companies operating tanneries in the state established in 1924 the Tannery Waste Disposal Committee of Pennsylvania, which has been carrying on investigations to determine the best methods of treating tannery wastes. In a similar manner, the Pulp

* The Sanitary Water Board, as now constituted, consists of the Secretary of Health, the Secretary of Forests and Waters, the Commissioner of Fisheries and 3 members appointed by the Governor.

and Paper Waste Disposal Committee of Pennsylvania was created in 1925 and, as a result of coöperation with the American Paper and Pulp Association, the National Committee on Stream Pollution for the Pulp and Paper Industry was formed in 1926.

In Ohio, conferences have been held by the State Department of Health with representatives of paper, beet sugar, canning, milk and steel industries, in an effort to secure voluntary action by industry in a study of wastes treatment problems. It is reported that this effort has met with considerable success, several committees having been formed for the purpose of carrying out the recommendations of the Department of Health.

The State Board of Health of Wisconsin has been coöperating with industries in the investigation of the treatment of pea cannery wastes, and the wastes from pulp and paper mills. The results of the investigations are given in a Special Report on Stream Pollution in Wisconsin prepared by the Bureau of Sanitary Engineering of the State Department of Health and issued in 1927 as a Joint Report of the Conservation Commission and State Board of Health.

Efforts to secure the coöperation of industries in the solution of wastes treatment problems have also been made by the state departments of health of Michigan, Maryland and other states. The cases cited show clearly the trend towards solving problems of industrial wastes treatment by coöperation with industry.

Phenol Wastes Conference of States on the Ohio River Watershed—The serious and widespread troubles from tastes and odors imparted to water supplies by the so-called phenol wastes from gas and by-product coke manufacturing, led the Surgeon-General of the U. S. Public Health Service, on January 29, 1924, to call together for a conference on the subject, representatives of departments of health of the states where complaints of pollution from this source had originated. This conference requested the U. S. Public Health Service to further investigate the problem with respect to its public health aspects, and the Bureau of Mines to investigate it in its industrial aspects, particularly in regard to practical methods of eliminating or treating the wastes at their source. These governmental departments have since made reports on the subject.

Following this conference, the Phenol Wastes Conference of States on the Ohio River Watershed was formed. This organization has held several conferences, and much progress has been made in controlling pollution by phenol wastes. On September 27, 1926, a committee was appointed called the "Board of Public Health Engineers, Ohio River Basin," and composed of the chief engineers of the departments of

health of eight states on the watershed, this committee to act in an advisory capacity.

Melcroft Coal Co., Acid Mine Drainage Case—Another source of serious and extensive pollution of water supplies is the acid drainage from coal mines. The Bureau of Mines has recently issued a report on the subject. The outstanding development with respect to pollution by acid mine drainage is the court decision in the so-called Melcroft Coal Co. case.*

In 1920, the Mountain Water Supply Co. of Pennsylvania, a subsidiary of the Pennsylvania Railroad, filed a bill in equity against the Melcroft Coal Co. and some 20 other coal mining companies to restrain them from permitting mine drainage to flow into Indian Creek or its tributaries. The case was tried before the Fayette County Court which, on December 26, 1922, rendered an opinion that the discharge of mine drainage by the defendant coal companies was a proper and natural use of their lands and constituted a right of property of which they could not be deprived except by due process of law, and dismissed the case.

The case was appealed to the Supreme Court of Pennsylvania, which, on September 29, 1924, rendered an opinion that the lower court was in error, and that "the defendants have no right of any kind to drain their mine waters into the stream, considering the public use which is made of its waters, and that their doing so constitutes a nuisance which must be restrained." The defendants were enjoined from discharging mine waters into Indian Creek above the dam of the Mountain Water Supply Co. after the expiration of 6 months from the date of entry of the decree.

Following the decree of the Supreme Court of Pennsylvania, the defendant coal companies sought to have the Supreme Court of the United States review the case, but after hearing briefs and arguments, the Supreme Court refused to do so.

In conformity with the decree of the Pennsylvania Supreme Court, an order was issued by the county court giving the coal companies until July 30, 1925, to cease discharge of mine drainage into the stream. On July 27, 1925, 4 of the principal defendants filed a petition in the county court setting forth a plan for disposing of their mine waters and asking for an extension of time. After hearing the arguments, the court suspended the rule which left these companies in contempt of court.

Contempt proceedings were brought against the other coal mining

* Information in regard to the progress of this case has been furnished by Wm. McCaleb, General Superintendent of Water Companies of the Pennsylvania Railroad.

companies and a decree was handed down declaring all the defendant companies, excepting the 4 referred to above, in contempt of court and ordering them to seal their mines within 30 days. Some of the companies complied with the order of the court but about 15 companies operating small mines failed to do so and the sheriff was instructed to seal these mines, which has been done. While the sealing did not entirely stop the flow of mine water, it effected a material reduction.

The 4 principal defendants joined together to incorporate a drainage company which has built a tunnel and flume about six miles long discharging the mine drainage below the dam of the water company.

Oil Pollution Act of 1924—Numerous bills to prohibit the discharge of industrial wastes into navigable waters or their tributaries were introduced in Congress in 1923 and referred to the Committee on Rivers and Harbors which held extensive hearings. The outcome was the so-called Oil Pollution Act of 1924."

This act provides that except in certain cases of accident or emergency or as permitted by regulations which the Secretary of War is authorized to prescribe, it shall be unlawful to discharge oil into or upon the coastal navigable waters of the United States from any oil burning or oil transporting vessel. The administration of the Act is placed into the hands of the War Department and penalties are provided for violation of the Act.

Report of War Department—An investigation of the pollution of navigable waters was made by the War Department in compliance with the Oil Pollution Act of 1924, and a report presented to Congress on June 4, 1926."

In addition to domestic sewage, the report lists the industries which are the sources of the more injurious polluting substances. These sources of pollution are discussed and the effects on navigation or commerce and on fisheries are described. A table is given showing navigable waters affected by pollution, the principal sources of pollution and the injurious effects. A summary of the findings is included and the existing federal laws relating to the pollution of navigable waters are summarized and data are given with respect to state control of pollution. The report states that industries are coöperating with local authorities in a study of the problem and devising methods by which injurious substances in the wastes can be recovered or rendered less harmful before discharge into the waters.

No federal legislation was recommended at this time with respect to pollution in general nor in regard to acid-mine drainage in particular. With respect to oil pollution, it was recommended:

. . . . that the oil pollution act of 1924 be made applicable to the discharge of oil from any source, into or upon the coastal navigable waters of the United States, or into or upon any of the Great Lakes, their harbors and their connecting channels."³

International Conference on Oil Pollution—Pursuant to a joint Resolution of Congress, a Conference of Maritime Nations was held at Washington, June 8-16, 1926, to consider means for the prevention of pollution of navigable waters by oil from oil burning and oil carrying steamers. Prior to the calling of this convention an Interdepartmental Committee on Oil Pollution of Navigable Waters was formed, which, after investigating different phases of the subject, made a report⁴ that served as a basis for the international conference.

The conference reached an agreement with respect to recommendations to the participating governments and adopted a Draft of Convention to take effect upon ratification by 5 of these governments. Various shipping interests and other interested organizations in the United States and Great Britain have agreed that the recommendations of the conference should be voluntarily put in operation.

Present Status of Oil Pollution—It is generally reported that oil pollution conditions have improved decidedly in recent years and, although conditions in many places are still far from satisfactory, the indications are that the oil pollution problem is well on the way to solution.

CONCLUSION

Although considerable progress has been made in the control of pollution by industrial wastes, much remains to be done. By continued scientific investigation of unsolved problems of industrial wastes treatment, by coöperative effort of all interested parties including industries themselves, and by reasonable laws wisely administered, the problem can be solved.

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DISCUSSION

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ALONG with the work of investigating streams for classification, the Sanitary Water Board is making a critical survey of several streams to determine accurately where and to what extent conditions are unsatisfactory, and to determine reasonable and practicable requirements for industrial waste treatment in order that the powers of assimilation of the stream may be utilized, as well as maintaining the stream in a satisfactory condition. For the State of Pennsylvania to flourish, we must preserve our industries as well as our streams.

The field work of a preliminary survey of about 200 miles of the upper Allegheny River has just been finished and the correlation of the data obtained is now being made. The portion of the river studied extends from Coudersport up through a part of New York State back into Pennsylvania to Franklin. The New York Department of Health coöperated in the study of the New York portion of the river.

The character of the survey was quite similar to that done by the U. S. Public Health Service on the Ohio River, except that the work, other than the routine sanitary chemical analyses, was done in a motorized traveling laboratory. In July and August this laboratory covered a distance of over 3,000 miles.

A similar survey is now in progress on the Schuylkill River between Reading and Philadelphia, a distance of some 60 miles.

Special surveys of the dissolved oxygen of the Brandywine Creek, the Bald Eagle Creek and the Susquehanna River above and below several paper mills have been made in connection with studies on paper mill wastes.

An intensive study of industrial wastes in Bridgeport, Pa., is now going on. These wastes are wool scouring, paper mill, packing house and pickling liquor.

Mr. Fales has referred to the coöperation of the Sanitary Water Board with industry. The Tannery Waste Disposal Committee of Pennsylvania consists of three chief engineers and three chief chemists of companies parties to the agreement, and the chief engineer of the Sanitary Water Board as chairman. The agreement provides for the creation of a fund of \$35,000 contributed by the companies in proportion to the capacity of their tanneries. To date the Sanitary Water Board has contributed considerably over \$8000 toward this fund.

The fund is being expended by the committee in research along three main lines:

1. Investigations in the laboratory to determine the characteristics and relative strength of the 15 wastes which are produced during processes of vegetable tanning of leather.
2. The erection, operation and study of full-scale experimental treatment works, predicated upon the results of the laboratory research work.
3. The study of streams to determine their assimilating capacity for tannery waste, untreated and treated to varying degrees.

In addition to research work in the laboratory and studies of twelve miles of stream below the Instanter tannery, a full-scale experimental sedimentation works was constructed and operated at Instanter.

Due to the closing down of a railroad, that plant had to be abandoned and the committee has constructed a new and improved plant on rather similar principles at Emporium, Pa. The construction of the new plant has practically exhausted the fund.

We are proposing to the companies parties to the original agreement to execute

a supplement which will extend the life of the original agreement and provide for \$25,000 from the companies and not less than \$5000 nor more than \$15,000 from the Sanitary Water Board.

The committee believes it will find reasonable and practicable ways and means for the treatment and disposal of tannery waste.

The second coöperative industrial waste project of the Sanitary Water Board was inaugurated in 1925 by the creation of the Pulp and Paper Waste Disposal Committee of Pennsylvania, consisting of engineers and chemists of that industry and the chief engineer of the Sanitary Water Board as chairman.

The first report of the committee to the board set forth a number of the problems which had already been solved by that industry. In Pennsylvania during the 10 years prior to 1925, 8 mills alone had expended \$2,500,000 for apparatus for the removal of materials from pulp and paper mill waste waters and for research in connection therewith.

For the still unsolved problems and the further improvement of the waters of the state, the committee recommended coöperative investigations.

The Sanitary Water Board then submitted a draft of agreement to the executives of the pulp and paper industry in Pennsylvania and this formal agreement dated November 17, 1926, has been executed by 24 companies who represent about 80 per cent of the entire output in the state. Under the agreement the committee has been enlarged to 15 members to include technical representatives of all types of mills.

Before even considering the subject of further treatment of pulp and paper mill wastes, the committee must first secure reliable scientific data upon the amount, kind and characteristics of the many different waste waters resulting from the manifold and diverse processes of manufacture of pulp and paper. In order so to do the committee has tentatively adopted standard methods for measuring, sampling and testing such wastes.

In accordance with the agreement 8 companies, parties thereto, volunteered the use of their existing laboratory facilities, regular apparatus and chemists. The Sanitary Water Board had preliminary studies made in its laboratory, furnished special apparatus for the 8 mill laboratories and provided training to the mill chemists in certain special tests to assure uniformity of technic as the work is done in the separate laboratories.

The work is being done in a thorough, careful, scientific manner and is bound to yield worth-while results.

In each of the 8 mill laboratories an assistant chemist has been assigned to work on the wastes and these men have been made associate members of the Pulp and Paper Waste Disposal Committee of Pennsylvania. They have in turn been formed into a sub-committee with the chief of the Industrial Waste Section of the Sanitary Water Board as chairman, who is also a member of the main committee. This sub-committee meets once a month to compare notes and discuss ways and means of solving difficulties in obtaining concordant results.

The main committee is kept informed of the work and although it outlines and directs the activities, the sub-committee is free to work out methods and details.

Coöperative work has also been done on laundry wastes and from all accounts, it may be that the same kind of procedure will result with other large industries.

Helpful coöperation of certain industries on the Monongahela, Shenango and Schuylkill Rivers has resulted in a great benefit to water supplies taken from those rivers, by the exclusion from the streams by-product coke oven and gas-house wastes.

The reversal by the Supreme Court of the lower court's decision in the Melcroft Coal Company case was a surprise to many, but it resulted in the collection and discharge of the mine drainage from the principal workings to a point below the water company's dam. Provisions have been made for other companies connecting should they so desire.

Not long ago I made a personal inspection of the valley and found by measurements and tests that the water now escaping from the sealed mines is either negligible in quantity or comparatively small; and that the acid content of the worst discharges is now only 50 per cent of what it formerly was and in some cases the drainage has actually become alkaline. This makes the reduction in total acid discharged daily a very large amount.

F. H. WARING

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AS noted by Mr. Fales, there have been several lines of endeavor between those in charge of the problem of control of pollution of streams and the industrial interests. In Ohio they may be listed as follows:

Investigation—It was necessary to make a stream pollution survey to note what agencies were causing the pollution and to study in detail the industrial processes originating the waste matters.

Legislation—Based upon the preliminary results of the survey, legislation was framed and enacted with a view to curbing and correcting industrial wastes pollution. Responsibility was placed with the State Health Department for this activity.

Coöperation—It was deemed essential that the problem of correcting pollution by industrial wastes be attacked in a coöperative manner. Education of those in charge of industrial operations was necessary to give them a knowledge of what material was causing pollution; research study on the part of industry was needed to bring about changes in processes to minimize, eliminate or change the materials causing the pollution. It was soon realized that experimentation would be required in many instances, and it was further agreed that such research and experimentation should be undertaken by industry.

Groups were formed of manufacturers

having similar processes causing wastes pollution. The problem was discussed with each group and specific instances called to the attention of the group where the pollution conditions were worst. A mutual understanding was reached by which the industry would proceed in the study and experimentation, and in return the health department would exercise a reasonable attitude in carrying out the provisions of legislation when those affected by the pollution demanded drastic action.

ACCOMPLISHMENTS IN TREATMENT AND DISPOSAL

Much progress has been made in the two years, particularly with the groups which have caused the most annoyance in stream pollution. The following will recite the accomplishment by groups.

By-product Coke Industry—The industrial wastes from this manufacturing group consist of crude phenol arising from the manufacture of coke and the refinement of tar resulting from the distillation of coal. Public water supplies in the past have been seriously damaged by reason of an offensive taste and odor of the most far-reaching character. Elimination of the phenol bearing liquids has been determined upon by this group of industry as being the positive answer to the problem. Much water is used in the quenching of hot coke and it has

been possible to eliminate the phenol bearing liquids by utilizing them in connection with the quenching of the coke in a closed system of operation.

There are 16 by-product coke plants in operation or under construction in Ohio, 8 being located on Ohio River watershed and eight others on Lake Erie watershed. Seven of the 8 on the Ohio River watershed have completed the elimination by means of the quench system, and 1 is disposing of the wastes temporarily by pumping them to an abandoned gravel pit for leaching into the ground. Of the 8 on the Lake Erie watershed area, 3 (Cleveland district) have adopted the quench system of elimination, 3 others pond the wastes and do not refine the tar, 1 utilizes a partial recovery process (benzol extraction), and 1 (Toledo) has made no progress. It is fair to state, however, that the plant at Toledo is withholding installing the quench system pending the decision of the city to receive the phenol wastes into the new sewage treatment works, designs for which are now being made.

Paper and Pulp Industry—A national organization of the paper and pulp industry has been in effect for several years. This organization has created a technical committee to cause research with the avowed intention of purifying the streams from paper and pulp wastes. As a result of their researches satisfactory processes have already been effected. In Ohio this problem of pollution by paper mill wastes has not been very acute. A local committee was organized to act for the paper mill interests. Two plants have installed "Save-all" devices, one at Dayton, the other at Chillicothe. It is felt that these installations are satisfactory in solving the problem at the 2 plants mentioned. It is of interest to note that the savings brought about by installing the new equipment have paid for the installation in less than one year's time.

Strawboard Manufacture—At the instigation of the Ohio Strawboard Manufacturers a group has been effected comprising 22 manufacturers and representing all of the strawboard mills in Ohio, Indiana, Illinois and the mid-west states. A committee has been appointed, funds are raised and experimental work is under way at 2 works, Cedarville, O. and Vincennes, Ind. The experimental plant now in operation at Cedarville utilizes the principle of chemical precipitation and chlorination of the waste liquid; the precipitate is maintained by the chlorine in fresh condition; it contains fiber and other matter which is returned for use in the makeup of the strawboard. These studies are still under way to determine amounts of material which can be reclaimed for use in the strawboard. It is also thought that the waste water after separation from the material can be entirely re-used in the process so that the strawboard polluting matter may be entirely eliminated.

The Vincennes experiment is upon the principle of substituting caustic soda for lime in the digestion of the straw. If recovery of the sodium salts can be effected with economy, the pollution problem should also be reduced very greatly, if not entirely, by this method.

Milk and Dairy Industry—This group has an active committee assisted by a consulting engineer for the service of all milk and dairy plants in Ohio. As a result of research, processes of treatment have been determined upon and 3 full-scale demonstration plants have been built. Two of the 3 are in complete operation and the third will soon be in service. The plants now operating are those of the Nestles Food Corporation at Sunbury; and the Chicago Walgreen Company at Holgate. The Toledo Paige Dairy Company at Bluffton will have its plant in service soon. The principle involved in the treatment of milk wastes and as exemplified in these plants, is the collection of the flow in a rela-

tively small capacity equalizing tank and application onto trickling filters immediately, without first passing through any settling or septic tank. Sludge is avoided and odors of decomposition eliminated. The effluent of the trickling filters is sufficiently oxidized to remain stable almost indefinitely. In order to prove economical it has been necessary to separate clean waters from contaminated waters; and to exercise good housekeeping in handling of the milk to eliminate all unnecessary milk discharges.

Acid Iron Wastes of the Steel Industry—A general committee and a technical committee have been formed by the group of steel manufacturers. The technical committee first reported upon several possible plans for eliminating the polluting material. The two ingredients to be cared for are weak acid and ferrous sulphate. The methods reported upon by the technical committee are (1) neutralization and chemical precipitation of the acid and ferrous sulphate as hydrate allowing the whole to flow to the stream; (2) the same as above but accompanied by removal of the precipitated iron hydrate and calcium sulphate by sedimentation; (3) the recovery of the ferrous sulphate by crystallization; and (4) the electrolytic recovery of iron and sulphuric acid.

The studies of the technical committee have indicated that the most probable methods thus far for serious consideration are items (2) and (3). Plants are already in operation recovering ferrous sulphate but the committee does not recommend the wholesale installation of ferrous sulphate recovery owing to the lack of market for its disposal. Therefore, the committee has leaned toward the precipitation of the ferrous sulphate as hydrate as a disposal method.

An experimental plant has been put in operation at the Cambridge works of the American Sheet & Tin Plate Company. The facts concerning the amount

of lime to effect neutralization of the acid and precipitation of the iron as ferric hydrate have been ascertained. Studies are now under way to attempt to find a market for the air-dried ferric hydrate and calcium sulphate, also the calcined and powdered form of the same material. The paint, cement and ceramic industries are being solicited in this regard. The technical committee has advised their membership that this method should be adopted wherever conditions are acute enough to demand immediate action. Obviously the expense of the method is considerable and it is for this reason that the studies are being continued.

The Canning Industry—In 1926 the canning industry of Ohio through its committee and consulting engineer installed and operated an experimental station at the Sears-Nichols Company, Canal Winchester, O. Many methods of treatment were studied. At the conclusion of experiments one method was recommended for universal adoption. In accordance with the program this cannery was to have installed a full-scale demonstration works but owing to the poor season and the financial difficulties of the company no operations were conducted at Canal Winchester in 1927.

Based upon the results of their experiment, however, other canneries have installed portions of the works recommended by the committee and its engineer, pending the establishment of the necessity for further treatment at the particular works involved.

In the meanwhile the New York Canners Association in coöperation with the Ohio canners employed the same engineer to install a full-scale demonstration plant at the largest cannery in New York State located at Albion. The works installed are based upon the Ohio experiment of 1926. Coöperation of the National Canners Association in this demonstration at Albion is effected. Preliminary reports indicate that with cer-

tain modifications of minor nature the New York works are constituted along the lines recommended originally in 1926 experiment. Briefly stated the following principles are involved: (1) Separation of clean waters from contaminated waters; (2) good housekeeping methods to keep at a minimum the waste materials passing into the sewer; (3) installation of fine screens, mechanically operated, in place of sedimentation; and (4) application of the screened liquid to oxidizing filters of the trickling type. The demonstration will determine such details as fineness of mesh, rate of flow through the screens, rate of filtration upon the trickling filters, etc.

Beet Sugar Industry—This group includes 5 beet sugar works in Ohio and 14 in Michigan. The joint arrangement is in effect because 3 of the 5 Ohio companies are also operating in Michigan. Studies are under way by the technical experts of the several companies involved, the research work being subdivided as to particular phases; for example, an installation was made at Ottawa, O., in 1927, comprising a mechanical screen of the self cleansing type to remove the maximum possible amount of suspended matter; this material has a value together with other coarse screenings for returning to the farmers for use as fertilizer. A Toledo company is experimenting with the salvage of the Steffens waste, the most concentrated and troublesome of beet sugar waste, to find out if a by-product material may be made with a saleable value. It is reported that some success has been indicated in the production of a condiment or cheap food for use in Japan and China.

CONCLUSION

In Ohio the State Department of Health has experienced the very best of coöperation with industrial groups. We feel that some of the problems have been solved so that industries now know the details for the correction of stream pollution. Some of the industries have not yet found a sufficiently satisfactory answer to recommend wholesale installations, but are in position to dictate what can be done if the conditions demand correction. Still other industries have not yet organized for effective campaign. However, this is not because they are not willing, but that they have not yet been approached by the health department.

It is obvious that the most important offenders should be taken care of first, and then the lesser offenders invited to enter the campaign. There is also the matter of limited personnel in the health department. It has been deemed wise to concentrate on a few groups constituting the most important, and when these have been established as smoothly working organizations attention will be given to the less important groups.

Our experience has been that much of the remedial measures must come from within the manufacturing establishment; therefore, the technical staff of the industry must certainly be enlisted in an effort to solve the wastes pollution problem. This is particularly true of the large corporations such as the by-product coke and steel industries, paper mill and strawboard industries. In other lines of activity, such as the milk and dairy industry, a large measure of the success is attributed to the employment of outside engineering talent to direct the researches and demonstrations.

Changing Tuberculosis Rates in Michigan*

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IN CONSIDERING the changing tuberculosis death rates we believe that a study of the conditions limited to the State of Michigan will be of more value than one covering a larger area. The facts for this study were taken from the death records on file with the Michigan Department of Health.

The death rates from all forms of tuberculosis by years, show a decline from 107.0 per 100,000 population in 1901, the highest rate, to 67.5 in 1925, the lowest rate, with a slight rise to 71.2 in 1926. This decrease from 1901 to 1926 of 35.8 per 100,000, or equivalent to about 33.5 per cent, seems all the more remarkable in that it took place in the face of an enormous increase in the population and through a period marked by war, and the hardships it entailed.

The geographical variation of tuberculosis rates in Michigan is marked. There are 83 counties in Michigan and for the purpose of this study they have been divided into 4 groups, ranging from south to north, the Upper Peninsula forming by itself the most northerly group.

In the Upper Peninsula the highest rate was in Schoolcraft County where the average rates decreased from 343.1 in 1901-1905 to 95.2 in 1921-1925, a decrease of 72.3 per cent. Only one county showed an increase.

In the northern counties one county showed a decrease of 78.8 per cent and all of the counties showed some decrease except two, which showed increases.

In the central counties the decrease was more even and ranged from 26 per cent to 57 per cent but all the counties showed a decrease.

In the southern counties every county showed decreases ranging from 22.7 per cent in Washtenaw to 74.3 per cent in St. Joseph, except Livingston County where the State Sanatorium is located.

All of these groups have shown a decrease in rate during the period

* Read before the Vital Statistics Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 19, 1927.

under consideration; the rate for the central counties falling over 50 per cent in 25 years, while the southern counties with a decrease of about 20 per cent showed the least decline. The rates for the northern and central groups have been roughly the same, while the rates for the Upper Peninsula and the southern group have also been similar.

In 1901 the rates for all 4 groups were much closer together than they were in 1926. The variation was from 89.0 to 109.8. In 1910 the spread was not any greater, being only from 97.7 to 104.6, but in 1926 the rate varied from 42.6 to 86.4; the lowest rate being less than one-half of the highest.

Table I gives the average rates for 1901 and 1925 for each group:

TABLE I

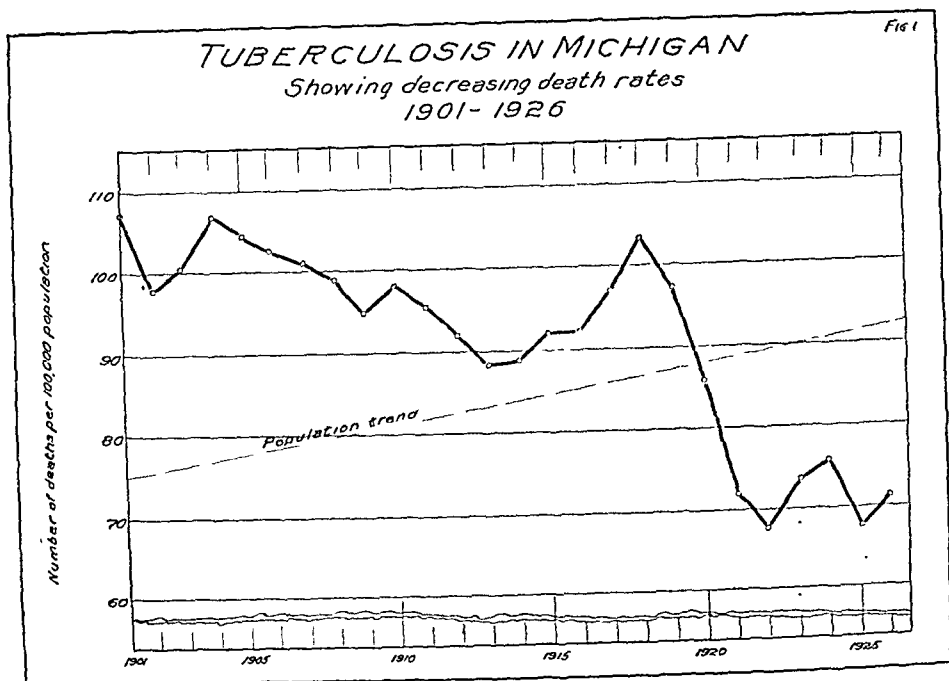
	Rate Per 100,000 Population 1901-1905	Rate Per 100,000 Population 1921-1925
Upper Peninsula	109.8	81.6
Northern Counties	89.0	52.0
Central Counties	98.6	42.6
Southern Counties	108.5	86.4

We do not believe the decrease is a question of climate but there are two factors which may be of influence: First, there are more sanatoria in the southern group but this would not affect the rate in the Upper Peninsula; second, there is more crowding of population in the lower group.

In 1926 this lower group represented about one-fourth of the area of the state but contained 56 per cent of the population. In this southern group is the city of Detroit with more than one-fourth of the total population of the state. Wayne County in which Detroit is located is now practically one large urban community containing two cities of more than 50,000 population each besides Detroit (Highland Park and Hamtramck) and the most of the tuberculosis sanatoria which serve Detroit patients are located outside of the city but in Wayne County. In 1926 there were 1,450 deaths from tuberculosis in Wayne County.

If we omit Wayne County from the southern group we find that the 1926 tuberculosis rate drops to 72.8 instead of 93.5. This is still far higher than the rates of 42.6 and 52.0 for the central and northern counties respectively. But this is too far above these latter rates to be passed without comment and we have gone further in the attempt to make corrections which will give us the true rate for the southern group.

Leaving out Wayne County, there seems to be no reason why the rate should not approach that of the other county groups for in nativity



and distribution of population these groups are similar to the others. There are no more large cities than in the rest of the state. In fact, the second and third cities in size are not in this group.

But if we study the death rates from 2 of the counties in this group, it is obvious that it is through the sanatoria deaths that the southern group rate has been made so high. Of course, there are other sanatoria in the state but the southern sanatoria have the widest sphere of influence. The State Sanatorium at Howell in Livingston County receives patients from the entire state. Of the 25 deaths which occurred in this sanatorium in 1926, 8 were residents of the central counties, 6 of the northern counties, 6 of the southern counties, 4 of Wayne County and 1 of the Upper Peninsula. Not one of these patients was a resident of Livingston County in which the sanatorium is located.

It will be recalled that deaths are required by law to be registered in the district in which they occur and while it is very easy to pick out the non-resident deaths, it is by no means easy to reallocate these deaths to the district of residence.

Yet considering these as county deaths, the Livingston County 1926 rate would be 76.5, but omitting these deaths the Livingston County rate would fall to 38.6, which is not at all out of harmony with the northern and southern county group rates.

Again take Calhoun County: here the rate was 106.0 in 1926. Three hospitals are located here which should be considered. The

County Hospital, while not in the city of Battle Creek, showed that 9 out of the 10 deaths were residents of Battle Creek and none were from outside of the county. The U. S. Veterans' Hospital showed 3 tuberculosis deaths, 1 from Wayne County and 2 from the Upper Peninsula. The American Legion Hospital at Camp Custer with 250 beds is the most important. It is primarily for tuberculosis patients and 53 deaths occurred there in 1926, only 2 of which were residents of Calhoun County. Twenty-seven came from Wayne County, the others being scattered and 3 being from outside of Michigan.

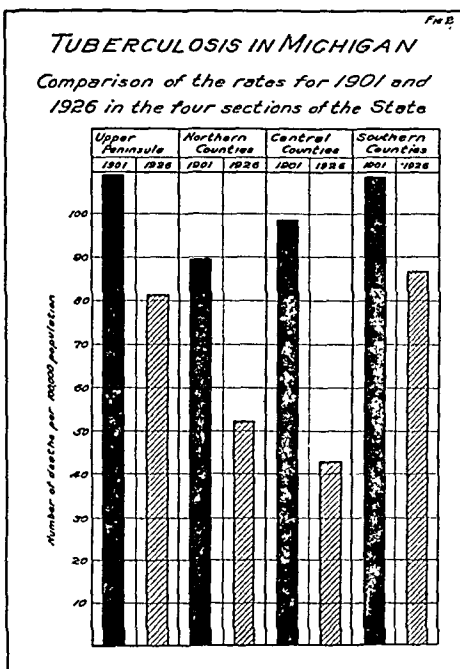
The Wayne County deaths should be charged to Wayne County which will, of course, increase that rate. The point is that the corrected Calhoun rate is 40.2, which is a great deal less than the record of 106.0 and is comparable to the more favorable northern and central group rates.

A correction for Washtenaw County would also show a decrease in the county rate of 129.6. The University of Michigan Hospital is located here and, while this is by no means a tuberculosis institution, there were many deaths

from tuberculosis, and as the University Hospital furnishes a service to the entire state these deaths were widely scattered.

On the other hand let us consider two counties in which no downward revision of the rate need be made. It is true that if the deaths in the large institutions previously considered were properly charged to these counties, the rate would rise but the increase would be but slight. These counties are Jackson and Ingham, each with a large city (Jackson and Lansing) where we would expect the rate to be somewhat higher, due to the urban influence, but we only have an actual rate of 55.6 and 47.5, respectively.

To recapitulate then, the high death rate in the southern county group may be explained in two ways: First, the city of Detroit, with an uncorrected rate for Wayne County of 93.5 which corrected would be even higher. The urban influence is quite evident. Second, the presence of the sanatoria in the southern counties which minister to the needs of the whole state.



Of course, we recognize the urban influence of crowding, inadequate housing, poverty, etc., but this is not sufficient to account entirely for the rate in Detroit. We must consider the effect of the racial stocks represented in the population. Of course, Detroit is a city of enormous industrial growth in the past 25 years and has attracted a great alien population. Thousands of Canadians largely of British stock have come into Detroit, as well as other nationalities. Dublin has pointed out that in New York and Pennsylvania the rate among the English and Irish was higher than it was for native whites; the Austrian, Russian and Italian rates were lower. He says, speaking of the marked difference in the rate of mortality which prevails in the various nativity groups composing the population of the country, "It is difficult for anyone confronted with these facts to escape the conclusion that an inherited racial immunity is a factor in the development of tuberculosis."

The racial factor, we believe, is also an explanation in a measure of the higher rate in the Upper Peninsula. There the factors of urban congestion and sanatoria of wide influence are not present, and the same period that has seen the great growth in Detroit has seen a wide immigration into the Upper Peninsula of foreign race stocks. This is particularly true of what is known as the mining districts where there are large numbers of Finns.

By the census of 1920 Michigan had a foreign born white population of 19.8 per cent. Every county in the Upper Peninsula (15 in all) with the single exception of Mackinac County, with 18.9 per cent foreign born white, has a percentage greater than that for the state, running as high as 37 per cent in Gogebic County. Of the 68 counties in lower Michigan, only 7 showed a rate exceeding that for the state. All but one of these were rural counties ranging from 20 per cent to 22.9 per cent. Wayne County had 29.3 per cent foreign born white in its population, and in Detroit there was 33.6 per cent of the population foreign born and we believe this explains in a measure the high tuberculosis rate for Detroit and Wayne County.

However, it would not be fair to take out Detroit without consideration of the effect on some of the other large cities such as Grand Rapids. Here the Holland Dutch are concentrated, and the county group rate is not affected. Detroit is the only city where the concentration of foreign born is so great that the county rate is increased because of it.

Despite the supposed Dutch population in Grand Rapids, the percentage of foreign born population in that city was only 25.2 per cent in 1920 and the foreign population of Flint and Lansing is 17.3 and 12.7, respectively, even below the state rate of 19.8. So if we consider

these other cities separately the county rate would not change appreciably.

Let us see, however, how the foreign population element in each county group compares with the tuberculosis rate, using the 1920 figures. The group in the Upper Peninsula with the highest percentage of foreign born population also shows the highest tuberculosis rate. Table II shows the percentage of foreign born white population in correlation with the tuberculosis rate:

TABLE II

District	Per cent of Foreign born white	Tuberculosis Rate
Upper Peninsula	28.8	103.7
Southern Counties	20.9	92.9
Central Counties	15.8	68.2
Northern Counties	15.7	77.6
State	19.8	85.8

Now we have already shown that the Upper Peninsula rate is high, due, we believe, to the foreign element. Let us analyze the composition of that foreign population and see how the rate varies for the several racial stocks.

The rate for some races is even below that for the United States and if those races predominate in the Upper Peninsula then our reliance on an alien element to explain the tuberculosis rate is unwarranted (See Table III).

TABLE III

COUNTRY OF BIRTH

Upper Peninsula rate 1920	98.6
Finland	260.0
Austria-Hungary	203.8
Sweden	154.4
Germany	80.1
Canada	59.8
England	41.8
Italy	38.1
Russia and Poland	34.0
Indian, Negro and Other	223.9
Native White	86.4

The rates for 5 of the races are below that for native white but each of these groups constitutes less than 2 per cent of the total population, except the Canadians. The races with the higher rates form a larger part of the population. The Finns, with a rate of 260.0, form only 8 per cent of the total population, yet they had 20 per cent of the tuberculosis deaths. The Scandinavians are another large element among the alien group while the stocks with the lower death rates make up, with the single exception of the Canadians, but small percentages of the total population. Of course, it must also be borne in mind that where the

foreign element bulks large in the total population, then the so-called native born white class includes many who are only first generation Americans. This is particularly true of the Finns, there being many who are classed as native white which the death records show to be the children of parents who were born in Finland.

Of course, any racial tendency toward tuberculosis would not be eradicated by such an accident as American birth and that may explain why the native white Upper Peninsula rate of 86.4 is even slightly above the rate of 85.8 for the entire state. The true native white rate would undoubtedly be much less.

While the negro population is small in the Upper Peninsula there are many Indians and it is a known fact that the Indian rate from tuberculosis is enormously high.

We fully realize the importance of age in this disease but a limited study indicates that this factor is too complicated to present here.

Many writers have mentioned the factor of general economic prosperity and its effect on the tuberculosis death rate, but because of the economic adjustments occurring all the time it is quite useless to take any one year and say, "Well, here is a high rate; probably due to a panic in Wall Street." The only thing we can say with certainty is that as the general standard of living has gone up, the tuberculosis rate has gone down. This is true despite the fact of the tremendous influx of aliens into Detroit and the other automobile producing centers to meet the demands of the automobile trade since 1901.

The rates for our 4 groups have decreased and we may say the general causes are, first, an increase in economic prosperity; second, the tuberculosis campaigns.

We might also conclude that the reason that the Upper Peninsula and southern counties have not decreased as rapidly as the other districts is because of the influx of foreign population into these districts, and the predominating races are from those countries where tuberculosis rates are higher than they are in the United States.

The general economic level of our state has risen in the past 25 years and we believe that this has had much to do with the declining tuberculosis rate, but further than this we can appraise the economic factor in greater detail and see its relation to the tuberculosis rate.

Korosi says, "Of the inhabitants of Budapest there die of consumption in every 10,000 well-to-do persons, 40; moderate well-to-do, 62.7; poor, 77.7; and paupers, 97." While no figures are available on the economic status of our Michigan deaths we would point out the fact that the higher rates are in Detroit and the Upper Peninsula where concentration of the foreign born is greater.

Little need be said about the relation between the standard of living and foreign stock. It is evident to all social workers that alien races are apt to be the ones living in crowded homes, with little ventilation, raising underfed children and unable to feel the need of or to pay for proper medical attention. The factor of an inherent susceptibility to tuberculosis in certain racial stocks is not the whole explanation. The economic feature must be considered. The foreigner comes to us and starts in under difficulty. He does not get a high wage and his living is not and cannot be on as high a scale as that of the native stock and so tuberculosis has a better opportunity to work its ravages on him.

To be sure, some races do have a lower rate, as Dublin has shown, but the English rate was fairly high. However, we found that the English and Canadian rates for the Upper Peninsula were lower than for native whites. This is exactly in accord with our premise about the economic well-being of foreign stocks. The Canadian is not so handicapped as the others, being familiar with our language and customs. He can get a better job and that means better living and more wholesome food for the building of sound bodies with which to withstand tuberculosis.

In the second place, undoubtedly, the organized effort to combat tuberculosis has contributed materially to the falling death rate. By the Michigan tuberculosis campaign we mean the efforts of all the societies, both clinical and educational, of the county and state, the state health department and also the work of the various sanatoria throughout the state. The results of this work in all its ramifications are so varied that any attempt to examine the many angles of the work or to correlate the efforts with any other rate would probably be misleading and a waste of time.

We can, however, outline in a general way the work that has been done without giving an opinion as to whether the rates have been affected in this or that locality.

In about 20 counties, local tuberculosis societies have been founded to carry on the work, leaving the state society free to work in the more sparsely settled counties which have not yet been able to support a county organization.

The work has been educational from the start and diagnostic clinics have been started soon after the foundation of the society. Many of these clinics have only been operated for the past 5 years, which is the chief reason why we cannot see any decrease in the county rates although the work may have been carried on quite effectively.

From 50 to 5,000 patients have been examined yearly in the several counties, the work being almost entirely local; that is, few non-

residents being cared for. The sanatoria and hospitals have also done excellent work. We have noted these previously because of their varying sphere of influence. The results of their work cannot be effectively recorded in any statistical way.

Besides the State Sanatorium and the American Legion Hospital, there are a total of 22 sanatoria under county, municipal and private ownership. The 4 state hospitals for the insane also have beds set aside for tuberculous patients, and at the Ionia Reformatory a tuberculosis hospital is maintained for criminals. The total number of beds available in the state is 2,432, while the deaths in 1926 numbered 3,041; or an average of 8 beds to every 10 deaths, which, although it is above the 7 to 10 ratio that Drolet found for the United States, and above the ratio for many foreign countries, is still below the estimated requirement of 1 bed for every death.

It is undoubtedly true that the modern facilities for the care of tuberculosis, which are perhaps best represented by the number of sanatoria beds, have an undoubted influence on the rate but it is probable that this cannot be directly traced. Michigan is fortunate in some ways in that it has been able to increase the facilities for the care of this disease.

The available beds for tuberculosis have increased from 75 in 1904 to 2434 in 1926. Tuberculosis sanatoria affect the tuberculosis morbidity and mortality in the following ways:

1. Arrests the disease and cures in incipient and moderately advanced cases
2. Isolate hopeless cases and thus prevent infection and contacts, particularly children in the family
3. Serve as educational centers for dissemination of knowledge regarding:
 - Prevention of infection
 - Early diagnosis
 - Cure of clinically ill tuberculosis
 - General hygiene
 - Education of physicians and nurses in the care of tuberculosis
 - Experimental studies and research

We believe that the subject as here presented can only cover the more important factors and that much would be gained by more extended research.

Present Requirements and Procedure for Washing Milk Bottles*

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MILK BOTTLES are washed for two purposes—first, to remove organisms or chemicals that may injure the milk or the milk consumer; second, to secure a clean looking bottle.

Jones¹ states:

The cleanliness of the final package in which milk, cream, and manufactured products are marketed is an index to the consumer that signifies to no little degree the care taken in plant operation. Without clean and sterile apparatus a high quality product cannot be marketed, and it stands to reason that the bottles must be physically and bacteriologically clean as well. . . . When the actual cost of maintaining sanitary conditions throughout the plant is considered it is comparatively small considering its importance to successful operation.

The milk bottle is cleaned through the use of various washing compounds and sterilizing agents, either with or without heat, by hand or in power driven machines. The word "sterilization" in connection with the washing of milk bottles does not carry the meaning usually given this term by the laboratory technician. Among milk plant workers the word "sterilized" means "practical sterilization" or "commercial sterilization." This is indicated in the paper prepared by Jones¹ when he says:

There seems to be no set standard on bacteria count of milk bottles or a method for determining the same. The opinions of different plant operators and dairy authorities seem to vary more or less on this point. It is the writer's view that quart bottles should not contain more than 100 bacteria per bottle. In some plants a standard of 500 bacteria per quart bottle is considered as sterile.

Myers² says:

Sterile bottles, although desirable, are not essential. Clean bottles, free from pathogenic organisms and with a low content of non-pathogenic bacteria, are all that is necessary from the sanitary point of view. If the washing operation can be made so efficient that the bottles when rinsed are clean and free from all disease producing microorganisms, the expense and time required would be decreased to some extent.

In this paper an attempt is made to set forth the present state

* Read before the Public Health Engineering Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 18, 1927.

requirements for cleaning milk bottles, and the conclusions reached by various investigators who have studied the problem.

State Requirements—Each state and the District of Columbia was asked to submit a copy of its regulations for cleansing milk bottles. The replies to this request may be grouped as follows:

- 14—No regulations for bottle washing.
- 6—Require bottles to be thoroughly cleansed.
- 2—Require bottles to be thoroughly cleansed and sterilized.
- 2—Require bottles to be washed and sterilized with steam.
- 8—Require bottles to be washed and sterilized with steam or hot water.
- 2—Require bottles to be washed and sterilized with steam or chlorine solution.
- 14—Require bottles to be rinsed, cleaned with an alkali solution and sterilized with steam or some other method approved by the state health authority.
- 1—Requires bottles to be washed and treated with hot water or steam or 5 per cent caustic soda solution or concentrated lye.

From the state requirements just given it is apparent that it was not intended to give specific directions for the cleansing of bottles. Fourteen states give certain general directions and then provide for other methods that the state health authority may indicate. Thus the health authority is left free to recognize any advancement in methods for cleansing bottles and approve the use of such methods. Only one state has specified the strength of washing solutions. It seems to be the opinion of the legislator that definite instructions should not be given at this time.

Conclusions of various investigators—In the studies reviewed three general types of bottle washers are considered:

1. *Hand Operated Bottle Washer*—This consists in first submerging the bottles in water containing a washing powder, then placing them on a revolving brush and finally applying steam through a perforated plate with manually operated valve or submerging the bottles in a tank containing a chlorine solution.
2. *The Hydraulic Washer*—This is a power driven machine in which a hot washing solution is pumped through jets into the bottles, then rinsed with clean water and finally treated with hot water or steam.
3. *Soaker Type Washer*—This is a power driven machine in which the bottles are attached to an endless belt which carries them through solution tanks in which the bottles fill and empty, then pass jets which spray washing solutions inside and outside or they are brushed inside and outside and finally cooled by cold water sprays for delivery to the conveyor connected to the bottle washer.

The chemicals used in the study made by the investigators include:

Sodium carbonate	Soap or colloidal alkalies
Sodium bi-carbonate	Tri-sodium phosphate
Sodium hydroxide	Chlorine

When bottles are hand washed the soda compounds act simply as cleansing agents and are not considered of sufficient strength to have a germicidal action. In machine washers, the strength of the solution

is not limited and the use of the chemicals as both cleansers and sterilizers has been studied. Sommer³ states:

The problem in washing bottles is to remove dried and curdled milk solids. A limited number of bottles will contain other foreign matter of a varied nature. To find a substance which would remove some of this foreign matter would be tantamount to finding a universal solvent. This would not be economical even if it were possible. . . . sodium hydroxide on account of its alkalinity is the logical choice as the cleansing chemical, its successful use without any additional chemicals verifies this choice, tri-sodium phosphate is necessary in the rinse in order to obtain a clear bottle, especially in the case of hard water.

Myers⁷ concludes that:

Lowering the pH of a washing solution by the addition of acid and by dilution has been shown to decrease its germicidal efficiency. Likewise, raising the pH of a washing solution by the addition of sodium hydroxide has been shown to increase its germicidal efficiency. Spores, although not destroyed readily by even extremely high hydroxyl ion concentration, have been shown to be destroyed in 5 minutes by the combination of a pH of 12.0 and a temperature of 80° C.

Myers' study⁷ of the action of washing solutions on the tubercle bacillus causes him to conclude:

. . . from what is known of the resistance of the tubercle bacillus to chemical disinfectants, especially alkalies, that the only effective means of destroying this organism in a short time is by heat. . . . It seems advisable to maintain constantly in the washing solution a pH near 13.0 and a temperature of at least 60° C. (140°F.) where the bottles are permitted to soak for 15 to 20 minutes in the washing solution. These conditions will insure clean, safe bottles, providing the rinse water is safe.

Myers⁷ has studied the effect of alkalinity in the destruction of bacteria and concludes:

The higher the temperature and the higher the hydroxyl ion concentration the shorter is the time necessary for the destruction of a given number of organisms. *Bacterium coli* is readily destroyed in cold solution when the hydroxyl ion concentration is as high as pH 11.0.

Parker and Smith⁸ through both laboratory and field work have made a study of the detergent and germicidal efficiency of a colloidal-alkali mixture. These investigators state:

There are two classes of dirt which detergents have to remove; one, where the particles of dirt are held to the substance to be cleaned by means of grease or oil; the other, where the dirt is held to the substance by the adsorption of the dirt to the surface of the substance. In the first case, by emulsifying the grease or oil, the binder between the dirt and the substance is broken and the dirt rinses away freely. In the other case, the adsorption between the colloidal material and the dirt is greater than the adsorption between the dirt and the substance being cleaned and, as a result, the particles of dirt are surrounded by a film of the adsorbed colloidal material and the dirt is then easily rinsed away.

It is shown that a soap solution belongs to the class of solutions known as colloidal solutions and since soap is a detergent it is classified with other detergents such as caustic alkalies and alkali carbonates.

The use of soap in conjunction with alkalies is explained as follows:

The fact that the detergent value of soap is due to its physical properties as determined by its colloidal nature, and also, that while the soda and caustic compounds ordinarily used for detergent purposes are of definite germicidal value, they lack the inherent cleansing properties of soap—led to the development of colloidal alkalies. Thus, the colloidal alkali possesses in addition to the effective alkalinity of the caustic and soda compounds, the detergent properties of ordinary soap.

From their field and laboratory studies these investigators conclude:

Apparently, the chief merit of a colloidal alkali lies in the improved detergency whereby the activity of its causticity is enhanced through the mechanical or physical removal (or perhaps, exposure) of bacteria from the dirt binder (in which they are entrapped) by emulsification of the grease and fats or by the adsorption between the dirt and the colloid. . . . The best results both from physical and bacteriological points of view were obtained by using the colloidal alkali mixture with actual caustic strengths of 1.2 per cent and 1.6 per cent NaOH and temperatures of 120° and 160° F. When using caustic soda alone as a detergent, the best results were obtained with concentrations of 4.0 per cent and 4.5 per cent NaOH and temperatures of 120° and 160° F.

Parker⁶ in a very recent paper concludes:

The newer knowledge concerning alkali detergents used in the automatic cleaning of glass containers may be summed up by stating that the germicidal properties of alkali detergents is determined by their causticity while their detergency can be enhanced through the development of compounds possessing in addition to the inherent degree of alkalinity, a colloidal nature. By utilizing this knowledge, detergents can be developed that will provide the maximum cleansing and germicidal properties.

Drain⁷ carried on a rather extensive laboratory study of the efficiency of hypochlorites and chlorinamines in the sterilization of milk bottles. In addition to a solution of chlorinated lime, made in the laboratory, commercial products were used such as B-K, Germ X, hypozone and sterilac. The commercial preparations were used according to the recommendations of the manufacturers. *Streptococcus lacticus* grown in lactose broth or secured from milk cultures was selected for the test organism. In a part of the study, commercial conditions were approximated by the use of a Blue Line Junior bottle washer which had a capacity of 2 cases per minute. A number of tests were made and hundreds of bottles were used. The investigator concludes:

Thorough rinsing mechanically removes large numbers of bacteria from milk bottles. Chloride of lime solution is very unstable and is effective only when fresh. The hypo chlorite weakens rapidly in a hot solution. Any organic matter accidentally carried over on the bottles or cases weakens it. The addition of steam to the rinse tank to keep a uniform temperature dilutes it. The chloramine solution did not reach its maximum efficiency for one or two days after being made up. Some commercial solutions contain a killing strength longer than others.

Whittaker, Archibald and Shere⁸ studied the efficiency of bottle

washing equipment in a large number of milk plants operating in the State of Minnesota. Among these plants there were installations of hand operated bottle washers and hydraulic bottle washers. In some cases steam was used as the final cleansing agent, in others steam and hot water were sprayed into the bottles through a series of perforated plates. In the plants using chlorine, the chlorine was applied by submerging the bottles in a rinse tank or it was added to the rinse and sprayed into the bottles through perforated plates. The investigators conclude:

The results obtained on the sterilization of bottles with apparatus using steam as compared with chlorine solutions indicates that chlorine is more dependable as applied in routine practice at the plants investigated. This is especially evident at the smaller pasteurization plants where manually operated apparatus is used. Steam, when properly applied with the automatic machines, gave satisfactory results, but it was observed in many instances the operators neglected to carry out certain details that are necessary in order to accomplish effective sterilization. . . . no cases have been reported of objections having been made to odors or flavors being imparted to the milk, or of any misuse of the chemical.

Whittaker and Archibald^o conducted a study to determine the strength of a chlorine solution that is suitable for the final cleansing of milk bottles. This resulted in recommending that "the rinse water contain not less than 35 parts per million of available chlorine." It was further shown that the rinse water should be tested from time to time to insure effective sterilization.

Some of the investigators quoted, have indicated that the usual strength of the alkali solution used in bottle washers is not sufficient to kill the tubercle bacillus and that sufficient heat should be applied in order to accomplish the destruction of this organism.

Calmette^o indicates the resistance of the tubercle bacillus to chlorine and caustic soda when he recommends the isolation of this organism by the use of antiformin. The procedure is given in part as follows: A measured quantity of the pathological material containing tubercle bacilli

. . . is mixed in a sterile centrifuge tube with an equal quantity of a 30 per cent solution of antiformin. The tube is corked with rubber, shaken vigorously and allowed to stand for one hour; then, after centrifugation, the supernatant fluid is poured off . . . The antiformin destroys almost all the contaminating bacteria and one usually succeeds in this way in obtaining pure cultures from the start.

It appears then that both alkali and chlorine used in milk bottle washing may not be relied upon to destroy this organism and that heat should be used.

Park^u has studied the thermal death point of tubercle bacilli for different periods of time at temperatures which might be employed for the pasteurization of milk. These results indicate the time and temper-

ature that may be necessary for the efficient operation of milk bottle washers. The table given by Park is as follows:

THE THERMAL DEATH POINT IN MILK OF THE TUBERCLE BACILLI EXPOSED
FROM 1 TO 30 MINUTES

155°	1 minute
145°	6 minutes
142°	10 minutes
140°	15 minutes
138°	20 minutes
136°	30 minutes

Possibly it is not necessary to use a bottle washing process that will kill tubercle bacilli. This subject should receive attention.

DISCUSSION

It is believed that the laboratory results reviewed set forth sufficient facts to warrant an extended study of their application in the field. More work similar to that carried on by Whittaker, Archibald and Shere is needed. A field laboratory equipped for chemical and bacteriological work in milk treatment plants and in charge of a technician acquainted with the practical operation of the equipment to be studied would no doubt answer many of our questions. The manufacturers of bottle washing equipment have made rapid advancement in the last 5 years. It may be that our knowledge of washing compounds and their application has not kept pace.

There is opposition to the use of steam or the use of hot water above 160° or 170° F. Possibly there are chemical combinations that will make high temperatures unnecessary. If this is shown to be true then the health authorities should give their sanction and the legislator should make the use of such methods possible and necessary.

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Brucella Abortus in Milk and Dairy Products*

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MEDICAL literature continually records a slow but steady increase in the number of cases of undulant fever in the United States. Since Keefer's report of the first case in 1924,¹ the authors have examined either cultures or blood serum, and sometimes both, from 24 patients suffering from this disease and know of 45 more cases which either have been reported in the current medical journals or have been called to their attention by personal communications with other bacteriologists interested in this disease. Undoubtedly, this is only a small percentage of the actual number that is occurring. We believe that there is no more of this disease in man at present than there has been for many years, but the finding of *Brucella abortus* infection in man explains some of the hitherto unidentified fevers which may have been ascribed to other bacterial agents.

The source of the infection in man demands the most careful study. There are two probable methods by which man may be infected, one wound infection and the other the introduction of the organism into the alimentary tract. Although the former should not be overlooked, the latter appeals to us as a more logical manner for the infection to occur. Therefore, we believe that it is necessary to examine those foods in which *Brucella abortus* naturally occurs. That milk contains *Brucella abortus* has been known since Smith and Fabyan² and Schroeder and Cotton³ described the infection in guinea pigs that had been injected with milk containing this organism. Their findings have been verified by many other observers and following such findings, some work was done to determine whether the presence of this infection in milk had any deleterious effect upon the health of man. Only meagre evidence was obtained at that time to show that any danger existed from drinking raw milk containing this organism. Because of the presence of this organism in the milk from certain cows that harbor *Brucella abortus* in their udders after abortion, and because of the recognition of the disease in man, these studies were undertaken.

* Read before the Laboratory Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 19, 1927.

The amount of abortus infection eliminated in the milk from a cow harboring the organism in her udder is very variable, but for the most part the greatest numbers are present soon after abortion. The infection in certain animals will become greatly reduced or disappear in 3 or 4 weeks, while in others it may persist throughout a lifetime. Very few studies have been made concerning the numbers of the organism that are discharged in the milk by a carrier. Evans¹ examined milk from 2 cows that had been artificially infected many times with *Brucella abortus*. The largest number of abortion bacilli recorded by her was 145,000 per cc. of milk. Her studies showed that virulent strains of the organism were not eliminated continually in great numbers in milk from aborting cows. In our experience with naturally infected animals we have found only a comparatively small number present in milk. Plate counts of milk from carriers in several herds showed an average of from 20 to 440 per c.c. Because of the difficulty in growing *Brucella abortus*, due to its peculiar demand for an increased amount of CO₂, the number observed may be only a general index to the exact number of living organisms present in a sample. The work of Huddleson² and that carried on in our own laboratory have demonstrated quite conclusively that by far greater numbers of the organism occur in the cream rising from a sample of milk than in the sediment or whole milk. Cultural methods have been used, but in our experience the injection of guinea pigs with cream removed from a given sample of milk is a more satisfactory method of determining whether or not the organism is present.

When one examines the literature concerning the percentage of infected cows that eliminate *Brucella abortus* in their milk, or the amount of infection that is present in market milk, he is impressed with the great variation in the results obtained by the several investigators. Schroeder and Cotton³ observed the infection in 83.3 per cent of 30 cows showing specific abortus agglutinins in their serum diluted 1-100 or higher. The author⁴ observed *Brucella abortus* in the milk of 66.6 per cent of a group infected with the disease. Pfenninger⁵ found infection in 34.8 per cent of his cases, Sheather⁶ in 34 per cent and Fitch and Lubbehusen⁷ in 29.9 per cent. A study has just been completed upon the milk from 378 cows from 3 certified dairies under one management. Infection was observed in 6.08 per cent of these animals as determined by guinea pig injection. Approximately 20 per cent of the cows showed specific abortus agglutinins in their blood serum. Studies on the presence of the infection in market milk have not been so extensive. Evans⁸ observed it in the market milk of the city of Washington, while Fleischner and Meyer⁹ recovered it from certified

milk in San Francisco. Carpenter and Baker¹³ found that 18 per cent of mixed milk samples from 50 herds supplying the city of Ithaca contained *Brucella abortus*. Undoubtedly, the dilution factor is responsible for the lower incidence of infection in market milk.

Because *Brucella abortus* occurred in milk and cream, we desired to determine its longevity in cream, butter and other milk products. Samples of naturally infected cream, as stated heretofore, show a large amount of infection because the fat globules carry up the organisms when they rise to the surface. Huddleson⁵ states that the infection does not appear to multiply in milk and cream held at ice box temperature. He observed that the number of viable organisms decreases rapidly when held longer than 8 days, and after 60 to 90 days he was unable to recover the infection from the milk. He does not state the hydrogen ion concentration of the milk at the time when he found the organism not viable.

To test the longevity of *Brucella abortus* in cream, one quart of pasteurized cream with a 40 per cent butter fat content was purchased from a local creamery. The quart of cream was divided into 4 equal amounts of approximately 250 c.c. each and placed in sterile Ehrlenmeyer flasks. Each flask was then inoculated with 5 c.c. of a water-clear suspension of *Brucella abortus* prepared in the following manner: The cultures were grown on a nutrient serum agar for 48 hours, then washed off with a sterile physiological salt solution and diluted to give a reading of 3 cm. on the Gates¹⁴ apparatus. One c.c. of this suspension was then added to 99 c.c. of a physiological salt solution which made the water-clear suspension. Four strains of *Brucella abortus* were used in the experiment and each flask of cream was inoculated with a different culture. Three of the strains, 80, 5532 and 5549 were isolated from milk, while the fourth, H-1, was recovered from the blood of a patient suffering from undulant fever. After thoroughly mixing the abortus suspensions with the cream, cotton stoppers were placed in the flasks and the cream was stored in the refrigerator at 8° C. Guinea pigs were then injected 4 times at 2-day intervals with 2 c.c. of each sample of infected cream to determine the length of time the culture of *Brucella abortus* would remain viable. After 8 days had elapsed guinea pigs were injected with the cream at 5-day intervals. The hydrogen ion concentration of the cream at the time of purchase, as determined by the colorimetric method, gave a pH of 6.

The longevity of *Brucella abortus* in butter was determined in a manner similar to that used with the cream. Four pounds of butter prepared from pasteurized cream were obtained and 10 c.c. of the same suspensions as used to inoculate the cream were mixed with each

pound of butter. The salt content of the butter was 1.5 per cent. The butter was then melted at incubator temperature and the culture agitated thoroughly with the fluid butter. The infected samples of butter were stored in the same manner as the cream, and guinea pigs were likewise injected.

The guinea pigs that received the samples of cream were autopsied at approximately 5 weeks after their injection and observations were made for lesions of abortus infection. The spleen was aseptically removed and placed in a sterile Petri dish for culturing, which was done by removing bits of the splenic tissue with sterile forceps and transplanting on serum agar. The cultures were either sealed with sealing wax or grown in jars in which 15 per cent of the atmosphere had been replaced with 10 per cent CO_2 . A sample of blood was removed from the guinea pig's heart and the serum set up with a known abortus antigen and tested for abortus agglutinins. The cultures from the spleens were allowed to incubate at 37°C . for 1 week and were then examined for evidence of growth of *Brucella abortus*. The cultures were identified upon their morphological characters, absence of motility, their inability to ferment a 1 per cent solution of dextrose in Hiss serum water and their agglutination by an anti-abortus serum. An agglutinin absorption test was completed on the culture if any doubt remained concerning its identity.

The results of such examinations showed that 2 of the strains, 80, isolated 7 years ago by K. F. Meyer" from certified milk and the human strain, H-1, recovered from a case of undulant fever remained viable in the cream and butter longer than the 2 other milk strains, 5532 and 5549, recently recovered by guinea pig injection. The cream infected with the 2 former cultures produced abortus infection in guinea pigs over a period of 10 days, while the latter failed to infect after 8 days. The inoculated cream failed to infect when the hydrogen ion concentration gave a reading of pH 5. Undoubtedly the death of the abortus organism was hastened by the production of lactic acid.

The samples of butter inoculated with strains H-1 and 80 produced abortus infection in guinea pigs for 142 days after inoculation, indicating that they were still viable at the end of that period. However these 2 strains caused no infection in guinea pigs 190 days after the butter was inoculated. Strain 5532 produced infection 81 days later, but not at 142 days. Strain 5549 failed to infect after a 32-day period.

Few examinations have been made upon market butter. Seventeen $\frac{1}{4}$ pound samples of butter were purchased from the local stores. This butter was brought to the laboratory and melted in the incubator. Two c.c. from each sample were injected subcutaneously into guinea pigs.

These guinea pigs were killed and autopsied at the end of 5 weeks as previously described. *Brucella abortus* was not demonstrated by animal inoculation to be present in the samples examined.

The causative agent of Malta fever was described by Bruce¹⁶ in 1891. Further studies by the Mediterranean Fever Commission¹⁷ showed conclusively that the infection is prevalent in goats' milk and that this is the chief source of infection in man in the Mediterranean district. In 1918 Evans¹⁸ observed that *Bacillus abortus* of Bang and *Micrococcus melitensis* described by Bruce possess practically identical biological characters and that the only reliable means of differentiating the 2 organisms is the agglutinin absorption test.

It has been suggested by some investigators that the source of infection of undulant fever in the United States may be due to the eating of imported cheeses. Many of the goats, sheep and cattle of the Mediterranean district and southern Europe are infected with *Brucella melitensis*. Since a quantity of sheep's and goats' milk is used in making these fine grades of imported cheeses consumed in the United States, a thorough examination of these cheeses for abortus and melitensis infection was made.

Due to the courtesy of the Kraft Cheese Co., the F. X. Baumert Cheese Co., Roethlisberger & Co. and the J. S. Hoffman Co. of New York City, we were able to obtain many samples of imported cheeses. Several samples of cheese were collected from the local market also. The samples collected locally were in the original packages and jars. The samples of cheeses examined from the above importing houses were collected with a standard cheese tryer in the form of small cylinders about $\frac{1}{2}$ inch in diameter and 3 inches long. The samples were then put into sterile tubes, labeled and brought to the laboratory.

The cheese was prepared for injection into guinea pigs in the following manner: First, the external surface of the cylinder was seared with a hot spatula to prevent the possible contamination of one sample by another because of using the same tryer in collecting all the samples. A piece of the sample about $\frac{3}{4}$ inch long was then cut off with a sterile knife or a similar amount taken from a jar or package and ground in a mortar with 2 c.c. of a physiological salt solution. Two c.c. of this mixture was then injected subcutaneously into a guinea pig.

Several of the injected guinea pigs died in a few days. They were autopsied and other pigs injected from the same samples of cheese with the exception of 2 cases in which the guinea pigs were found to be infected with *Vibrio septique* which was evidently in the cheese. Because of this infection it was decided that reinjection was useless.

Of the 82 samples of cheese collected, 72 were imported. Of this

number 30 were manufactured in Italy, 14 in France, 13 in Switzerland, 6 in Holland, the remainder in England, Germany, North and South America. The majority of the types examined were Swiss, Roquefort, Reggiano, Gorgonzola and Edam cheeses. Infection with *Brucella abortus* or *Brucella melitensis* was not found in any of the guinea pigs injected with these samples.

DISCUSSION

The percentage of cows from the certified dairies harboring *Brucella abortus* in their udders was 6.08. Guinea pigs were injected with 2 c.c. of a mixed sample of cream from either 4 or 5 cows. If abortus infection was observed at autopsy guinea pigs were then injected with individual samples from the cows comprising the group. Due to this method of carrying out the work, milk from 18 cows could not be reexamined because their lactation period had ended. Therefore, the correct percentage of infection should be slightly higher. The number of carriers, however, was much smaller than we expected to find, inasmuch as approximately 20 per cent of the cows showed specific abortus agglutinins in their blood serum.

We believe that the injection of guinea pigs with the cream from the samples is as accurate as any method for determining the presence of *Brucella abortus* infection in milk. Although it is not yet known how few abortion bacilli are required to infect a guinea pig, evidence points to the fact that only a few are required. The work of Hagan²⁹ shows that 100 or fewer abortus organisms will infect guinea pigs weighing from 385 to 495 grams. Perhaps an explanation for so little abortus infection in such a large group of cows from certified dairies is due to the fact that an animal is eliminated from the dairy if she is a poor producer and often aborting cows have short lactation periods and secrete a small amount of milk. Therefore many such infected animals would be removed. The strict sanitation practiced in a certified dairy may help reduce the number of carriers if abortus is spread from one animal to another through the invasion of the teat canal. The abortus lesions produced in the guinea pig were typical of bovine strains. No distinct abscessation of the lymph glands, spleen or liver, such as often develop in guinea pigs injected with human and porcine strains, was observed. The joints were not affected and the majority of the guinea pigs showed an increase in weight.

There is a possibility that many of the abortus organisms may have been destroyed by the bactericidal effect of the milk or by being chilled by the ice during the shipment from the dairies to the laboratory, which was in some instances practically 72 hours after the samples were collected. With such a small amount of infection in such a large

quantity of milk, the dilution factor would be so great it would undoubtedly be difficult to recover the organisms from the mixed milk, although *Brucella abortus* may occur in large numbers in milk from a certain animal. However, our studies show that comparatively few are present. The number discharged daily in the milk is very variable. The results of the Mediterranean Fever Commission¹⁶ on the number of *Brucella melitensis* organisms present in goats' milk each day showed a variation from none to 30,000.

If man becomes infected from certain strains of *Brucella abortus* that may be in milk, cream would be a greater infective agent than whole milk, because the largest number of the organisms occur in the cream. We fail to find the results of any observation on the length of time the organism can live in cream, but from the work we have done, it seems evident the percentage of butter fat in the cream and the hydrogen ion concentration of the skim milk in the cream are the controlling factors. It will be noted that of the 4 strains used, two, 80 and H-1, remained viable 2 days longer than two recently isolated, strains 5532 and 5549, which were recovered from milk. Strain 80 was isolated from milk about 7 years ago and in our studies has always been more virulent for guinea pigs than the other 2 milk strains. The human strain used also produced extensive abortus lesions in guinea pigs. The artificially inoculated cream failed to infect guinea pigs when the pH became 5. Evidently the higher the percentage of butter fat, the longer *Brucella abortus* will live in a given sample of cream if stored at refrigerator temperature because the more compactly the fat globules are packed, the less skim milk can the sample contain. The work of Sharp and McInerney¹⁷ shows that the hydrogen ion concentration of a sample of cream or butter is approximately the same as that of the skim milk or buttermilk in it. This evidently indicates that butter made from sweet cream infected with *Brucella abortus* will still contain living abortus organisms, and that if butter made from sour cream does not reach a pH of 5, the infection may be carried over in this butter also. The above hypothesis becomes strengthened when it is considered that the same strains of *Brucella abortus* as used in the cream remained viable in butter for about 15 times as long as it did in cream. The amount of infection in the butter was approximately the same as that in the cream. We do not consider that the samples were any more heavily infected than would have occurred under natural conditions.

Two of the cultures, 5532 and 5549, inoculated in butter, infected guinea pigs 81 days and 32 days respectively after the butter was inoculated and stored in a refrigerator, while no infection was found in guinea pigs injected after 142 days and 41 days respectively. Strain

H-1 and 80 still produced abortus in guinea pigs at the end of the 142-day period, showing that the butter had no marked bactericidal effect on the culture. The hydrogen ion concentration of the butter had changed only very slightly during this period. It is interesting to note that the 2 strains H-1 and 80, most virulent for guinea pigs, were the most resistant in the cream and butter.

The examination of 17 samples of market creamery butter for *Brucella abortus* showed no viable organisms, but, undoubtedly, most of the samples and perhaps all were made from pasteurized cream. It is difficult to draw any conclusions concerning the infection in market butter from such a small number of samples, and especially so inasmuch as the manner in which the butter was made is not known.

No evidence of *Brucella abortus* or *Brucella melitensis* was found from the injection of guinea pigs with extracts of cheeses. Since imported cheese was suggested as a possible source of infection for the cases of undulant fever occurring in the United States, we thought it important to make these examinations. However, the methods employed in manufacturing and processing these cheeses, such as heating, souring and ripening, militate against the chance of these organisms being viable in cheeses, even though they may have been present in the various types of milk and cream from which they were made. The Mediterranean Fever Commission¹ studied the length of time *Brucella melitensis* would live in cheese and particularly in the type of cheese which is similar to the so-called "cottage" cheese that is made in the United States. It is prepared from whole goats' milk to which acid or rennet is added to curdle the milk. The curd is then put in basketwork moulds so that the whey may drain off. The acidity of this cheese varied from +80 to +90 when titrated with N/5 KOH, phenolphthalein being used as an indicator. The organism was never found viable in such cheese 48 hours after its preparation.

An examination of 82 samples of various types of cheese may not be sufficient data upon which to base conclusions concerning the general situation but we believe that the information obtained indicates that *Brucella abortus* and *Brucella melitensis* are rare in cheese if not entirely absent.

Not many data are available on the thermal death point of *Brucella abortus*, but the evidence at hand from preliminary studies indicates that proper pasteurization, such as recommended for the destruction of the tubercle bacillus in milk, 140°F.-145°F. for 30 minutes, will destroy *Brucella abortus*. We have completed thermal death point studies on the four strains of *Brucella abortus* used in the foregoing experiments to inoculate the cream and butter artificially and we

found a variation in the thermal death point of the 4 cultures employed. The 2 strains, 80 and H-1, most virulent for the guinea pigs, remained viable after exposure for 10 minutes at 140° F., while the other 2 less virulent strains, 5532 and 5549, failed to grow in cultures after 10 minutes' exposure at the same temperature. The 2 former strains were dead, however, after 15 minutes exposure at 140° F. At 160° F. all 4 strains were living after exposure for 30 seconds but dead after exposure for 1 minute.

CONCLUSIONS

1. The cream from samples of milk from 378 cows injected into guinea pigs showed that 23 cows, or 6.08 per cent were eliminating *Brucella abortus* in their milk.

2. Two bovine strains of *Brucella abortus*, 5532 and 5549, artificially inoculated into cream and stored at 8° C., remained viable for 8 days. Two other strains, 1 bovine, 80, and 1 human, H-1, more pathogenic for guinea pigs than the above strains, infected guinea pigs for a period of 10 days after being inoculated into cream.

3. The 2 strains 5532 and 5549 of *Brucella abortus* artificially inoculated into butter and stored at 8° C. remained viable and infected guinea pigs for periods of 81 and 32 days respectively. The other bovine strain, 80, and the culture H-1, isolated from the blood of man, were viable at 142 days after being inoculated into the butter, but not after 192 days.

4. Guinea pigs injected with 17 samples of market creamery butter showed no evidence of *Brucella abortus* infection at necropsy.

5. Guinea pigs injected with 82 samples of cheeses, mostly imported varieties, failed to show any evidence of *Brucella abortus* or *Brucella melitensis* infection.

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Typhoid Fever in Knoxville, Tenn.

With Special Reference to Findings in a Sanitary Census Conducted Through the Schools

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WHEN the Bureau of Health of the City of Knoxville was reorganized in 1924, one of the first problems to receive attention was the institution of more effective control of typhoid fever. To this end a study of the prevalence and distribution of this disease was begun early in 1924; and in the following year the coöperation of the Department of Epidemiology of the Johns Hopkins University School of Hygiene was obtained.

The study, which will be very briefly outlined in this paper, has included:

1. A review of the history of typhoid fever in Knoxville during the past 20 years, comparing its course with that in other southern cities. This study has necessarily been based on mortality statistics, since reliable statistics of morbidity for the entire period are not available for Knoxville or for all the other cities.

2. A sanitary survey and census of the city with special reference to the existence and the local distribution of conditions presumably contributing to the prevalence of typhoid fever. This survey is not yet completed, and for purposes of this paper reference can be made only to some rather general facts and to data collected in a special survey in January, 1926.

3. A detailed epidemiological investigation of all cases of typhoid fever as reported in the city. As a necessary preliminary to this investigation vigorous efforts have been made to secure full and prompt morbidity reports from practicing physicians with a degree of success which has been gratifying.

The history of typhoid fever in Knoxville has been similar to that in most American cities in that the trend of mortality during the past 20 years has been consistently downward. Thus, in successive 5-year periods from 1906 to 1925, inclusive, the average annual mortality rates have been:

1906-1910	54.8 per 100,000 population	1916-1920	23.2 per 100,000 population
1911-1915	33.8 " " "	1921-1925	20.2 " " "

Notwithstanding the consistent decline shown by these figures the record to 1925 cannot be considered satisfactory because the rate of decline has been somewhat less in Knoxville than in most other southern cities for which records are available, and because, in the 5-year period 1921-1925, and in nearly every single year of that period, the mortality rate in Knoxville was higher than in most cities which are properly comparable as regards size and geographic location.

With respect to racial and seasonal distribution the statistics of Knoxville show what is usually found, namely, that the mortality has been consistently higher in negroes than in whites and that the season of greatest mortality has been from July to October, inclusive.

GENERAL STATUS OF PUBLIC SANITATION

The excessive prevalence of typhoid fever in cities has usually been found to be intimately related either to contamination of the drinking water, or to insanitary methods for the disposal of human excreta, or both. Therefore, while the study which is being made in Knoxville takes full cognizance of other factors, notably the milk supply* and the adequacy of bedside prophylaxis, the present account refers chiefly to the relation of the disease to water supply and excreta disposal.

Water Supply—The public water supply of Knoxville is now and for a number of years has been taken from the Tennessee River, from an intake located above the sewer outlets of the city. It is artificially purified by rapid sand filtration and chlorination, and is generally distributed throughout the city, so that it is accessible to practically the entire population.

The raw water at the intake is undoubtedly polluted to such extent that without purification it would be grossly dangerous for drinking purposes. The pollution is, however, chiefly from rather small and distant cities and from the surface-drainage of rural areas, and is not sufficient to impose an excessive burden upon a well constructed and well operated purification plant. The municipal purification plant, as it stood in 1925, was not ideal in all its features, but it was operated under expert supervision, controlled by necessary chemical tests, and the results checked by detailed bacteriological examinations made at the filter plant and independently in the laboratory of the Bureau of Health. These examinations indicate that the effluent was of con-

* In 1925, 21 cases of typhoid fever occurred in two distinct outbreaks attributed to contamination of milk from two dairies, carriers being responsible in both instances. Since then, there has been no concrete evidence of the transmission of typhoid fever in the city by milk or milk-products. In 1925 about 25 per cent of the city's milk supply was pasteurized. This proportion has now been increased to 50 per cent, and other improvements have been made in sanitary control.

sistently good quality as judged by the rather rigid bacteriological standards which are at present in vogue.

In previous years, from say, 1906 to 1920, the plant was less complete, lacking provision for chlorination, and was less skillfully operated; but in the opinion of U. S. Public Health Service officers who made careful surveys in 1911 and 1915 the water supply was at those times of a sanitary quality which compared favorably with that of most municipal supplies. These findings together with certain readily established facts concerning the local distribution of typhoid fever in Knoxville seem to us to indicate that the public water supply is not and in recent years has not been a factor of any considerable importance in the prevalence of typhoid fever in the city.

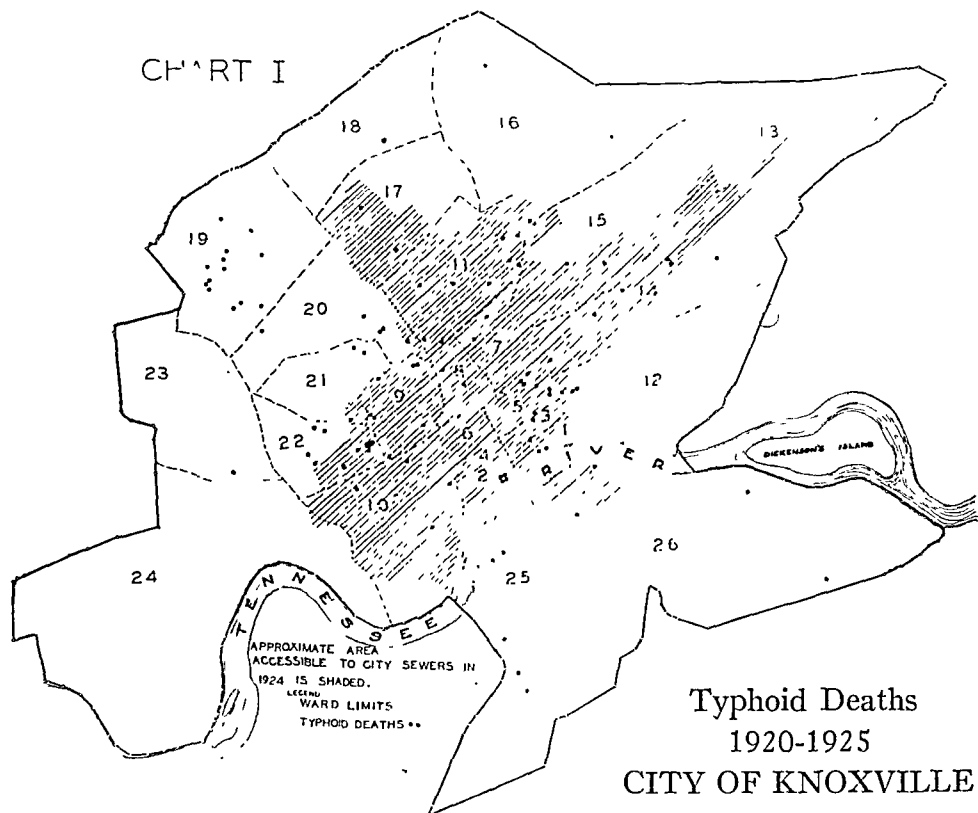
However, notwithstanding the fact that the public water supply is of good quality and is accessible to practically the entire population of the city, a certain proportion of the residents continue to obtain their drinking water from springs and wells. Many of these are so located as to be obviously subject to dangerous contamination with human excreta, and this opinion is confirmed by bacteriological evidence. For instance, in 1926 bacteriological examinations were made of 39 springs located within the city limits, and used by considerable numbers of people, each spring being examined twice. In 30 of the 39, the presence of *B. coli* was demonstrated in 1 c.c. or less of the water.

Prior to the study which is reported in this paper no exact information was available as to the number of persons habitually drinking water from springs and wells; but the results of the special survey which is cited later indicate that in 1925 probably from 5 to 15 per cent of the population was using water from such sources either habitually or occasionally.

Sewerage—In the report on the Municipal Health Department Practice for the year 1923, issued by the U. S. Public Health Service as *Public Health Bulletin, No. 164*, it is stated that in Knoxville, at that time, only about 50 per cent of the population was served by the public sewerage system and it was shown that with respect to completeness of sewerage, Knoxville stood very near the bottom of the list of the 100 cities included in the survey. It appears from information subsequently collected that this estimate of sewered population was too low, and that 60 per cent would be a closer figure for the year 1925.

The accompanying map, Chart I, shows the approximate area covered by the public sewerage system in 1924 and the geographical distribution of the deaths from typhoid fever for the 6 years, 1920-1925, inclusive. No definite relationship of typhoid to lack of sewerage is discernible. However, the map does not show the distribution of

insanitary methods of excreta disposal, since insanitary privies were fairly common in some of the sewered areas, while in certain of the unsewered areas provision was made in many houses for sanitary disposal of excreta by flush closets connected with cesspools, septic tanks or private sewers.



While it was not difficult, in 1925, to make a fair estimate of the aggregate sewered and unsewered populations, no exact information was available regarding the extent of the use of various methods of disposal. It was found impossible to complete the house to house survey during that year, and though the work is progressing it has not yet been completed. Therefore, in order to provide the information necessary for a study of the relation of typhoid fever to excreta disposal it was necessary to resort to the less exact but more expeditious method of securing information through the children attending public schools.

THE SCHOOL SANITARY CENSUS

By arrangement with the school board an inquiry of this kind was organized in January, 1926. A blank form asking the source of drinking water, location of toilet, number in family, etc., was drawn up and dis-

tributed, through the principals of the public schools, to the children of the 5th, 6th, and 7th grades in every public school in the city. Necessary explanations were given and each child was requested to fill out the record for his own home.

In this way information was obtained, in a single day, from 4,271 children, representing over 4,000 separate families, comprising about 25.6 per cent of the city's population in all sections of the city.

The accuracy of the information furnished was checked by sanitary inspectors of the Health Department, who were sent to about 140 of the homes which had been included in the survey; and by comparison of the reports of children where two or more had rendered reports for the same address. The information furnished in the school survey was found to be substantially accurate.

The records of this survey were first assembled and tabulated by wards, to show for each ward the proportion of the canvassed families using each of the designated methods of excreta disposal and the proportion habitually using water from springs or wells. In each ward separate tabulations were made for the white and colored populations. Considering the character of the population included in the school survey, it seems fair to assume that if the canvass had included the entire population, the distribution of sanitary conditions in each ward would have been approximately that indicated by the sample which was actually canvassed. On this assumption an estimate has been made, for each ward, of the proportion of the population falling into each class, and the estimates for individual wards have then been summarized into an estimate for the whole city. This summarized estimate is given in Table I.

TABLE I
ESTIMATED NUMBER OF PERSONS,* WHITE AND COLORED, USING DESIGNATED METHOD OF DISPOSAL

Method of Excreta Disposal	Number		Per Cent of Total			
	White	Colored	Total	White	Colored	Total
W. C. in house	45,080	4,511	49,591	55.3	32.5	52.0
W. C. in porch	11,052	3,117	14,169	13.5	22.5	14.8
W. C. in yard	3,165	1,718	4,883	3.9	12.4	5.1
Total Flush Closets**	59,297	9,346	68,643	72.7	67.4	71.9
Privies	22,305	4,515	26,820	27.3	32.6	28.1
Total	81,602	13,861	95,463	100.0	100.0	100.0

* Estimated population as of July 1, 1925

** Includes estimate of 1224 persons (1050 white and 174 colored) living in premises with both flush closet and privy

If it be estimated that about 5 persons use each privy or closet the above figures would indicate that at the time of this survey there were in the city about 5,360 privies, of which some 400 to 450 were located in the eight wards which were completely accessible to the public sew-

erage system. On the other hand, in the wards which are not reached by public sewerage system, considerable numbers of flush closets are reported, discharging into cesspools, septic tanks or private sewers.

The population of the city may be classified into those who habitually use city water for drinking and those who habitually use water from other sources, chiefly springs and wells. As there appears to be no great difference between the white and colored population with regard to the use of springs and wells, it seems unnecessary, in summarizing the data, to make a distinction between the two races. An estimate for the entire population of the city, is given in Table II.

TABLE II

ESTIMATED NUMBER OF PERSONS HABITUALLY USING DRINKING WATER FROM
(A) MUNICIPAL SUPPLY, AND (B) OTHER SOURCES

Source of Water Habitually Used in the Home	Population using designated source Number	Percentage
(a) Municipal Supply	89,408	93.7
(b) Other sources, chiefly springs and wells*	6,054	6.3
Total	95,462	100.0

* In making this estimate the few families reported in the school survey as using water both from the city supply and from springs and wells have been counted as using springs and wells.

Allowing, in each family, at least one child in school and one adult employed outside the home, it may be inferred that not less than 40 per cent of those who habitually drink spring or well water at home are in the habit of drinking the city water at school or at their places of employment, so that probably not less than about 96 per cent of the city's population (93.7 per cent plus 40 per cent of 6.3 per cent) drink the city water to some extent. There are some who habitually drink city water, who occasionally drink spring or well water, but it is probable that the great majority of the city's population, perhaps 85 or 90 per cent of the residents, rarely if ever drink water from any source except the public supply.

EXCRETA DISPOSAL AND SOURCES OF DRINKING WATER

Excluding cases of typhoid in persons residing outside of Knoxville, brought into the city for treatment, and excluding also cases in which the diagnosis of typhoid fever was withdrawn, there are included in the records of the Health Department, 249 cases of typhoid fever for the period May 1 to December 1, 1924,* 163 cases for the year 1925, and 57 cases for the year 1926. Each of these cases was visited by an agent of the department and the usual epidemiological data secured, including information as to the method of excreta disposal used in the home and the sources of drinking water used by the patient during the

* There were no cases reported during the first 4 months of 1924. If any cases occurred the number is probably small, so that the cases recorded may be assumed to represent the total for the year.

30 days prior to onset of illness. Of the 469 cases there are 29 in which the method of excreta disposal is not stated and 27 in which the sources of drinking water were not ascertained.

For the population of the city as a whole and for white and colored persons separately, the estimated attack rates for those living in homes provided with flush closets and with privies respectively, for the whole period May 1, 1924, to December 31, 1926, are given in Table III.

TABLE III
INCIDENCE OF TYPHOID FEVER, KNOXVILLE, TENN., 1924-26, INCLUSIVE; THE POPULATION CLASSIFIED BY COLOR, ACCORDING TO METHOD OF EXCRETA DISPOSAL

Method of Excreta Disposal	Estimated population using designated method			Typhoid Fever, 1924-26 (incl.)			Incidence per 10,000		
	W.	C.	Total	Number of cases*			W.	C.	Total
(a) Privies	22,305	4,515	26,820	151	70	221	67.7	155.0	82.4
(b) Flush Closets	59,297	9,346	68,643	189	30	219	31.9	32.1	31.9

* Exclusive of 29 cases in which the method of disposal is not stated.

According to this analysis, the population living in homes provided only with privies, suffered from typhoid fever more than twice as severely as did the population using flush closets in their homes. The difference is not to be explained by the larger proportion of negroes in the former class, for, as shown in the summary, the difference remains when separate analyses are made for the white and colored populations.

In the investigation of cases in 1924 no distinction was made; in the case records, between flush closets located in the house and those located outside, on the porch or in the yard; but in the 1925 and 1926 records this distinction was made. The populations using these different types of flush closets are given in Table I; and, combining these data with the records of typhoid fever cases reported in 1925 and 1926 the summary shown in Table IV may be made.

TABLE IV
INCIDENCE OF TYPHOID FEVER, KNOXVILLE, TENN.; (A) AMONG THOSE HAVING PRIVIES AND AMONG THOSE HAVING FLUSH CLOSETS, (B) OUTSIDE AND (C) INSIDE THE HOUSE.

Method of Excreta Disposal	Population	Reported cases of typhoid fever 1925 and 1926	
		Number	Incidence per 10,000
(a) Privy:	26,820		
(b) Flush closet outside on porch or in yard:		92	34.3
(c) Flush closet in the house:	19,052	41	21.5
	49,591	59	11.9

NOTE: Twenty-eight cases in which the method of excreta disposal was not stated have been omitted. This omission necessarily reduces the incidence rates in the last column, but presumably does not alter their ratios to each other.

The lowest prevalence of typhoid fever has therefore been in families living in houses with closets indoors; a considerably higher prevalence occurred in families using outdoor closets, which are often of less sanitary construction and less cleanly; while a still higher inci-

dence prevailed in the users of privies. While the three classes represented no doubt differ in habits and economic status, there can be little doubt that the differences which would have the most important bearing on typhoid morbidity are those in methods of excreta disposal.

When the data for individual wards are studied it is found that in general the higher the proportion of the population using privies, the higher has been the typhoid incidence in the period under consideration. This may be demonstrated by computing the coefficient of correlation, between the percentage of population using privies, and the typhoid morbidity rate, which is found to be quite high, ($.47 \pm .10$); or it may be shown more simply by grouping the wards as shown in Table V.

TABLE V

INCIDENCE OF TYPHOID FEVER, KNOXVILLE, TENN., 1924, 1925 AND 1926 IN THREE GROUPS OF CITY WARDS, CLASSIFIED ACCORDING TO PROPORTION OF POPULATION USING PRIVIES.

Classification of wards	Aggregate population July 1, 1925 (Estimated)	Per cent of group population using		No. of cases* 1924, 1925 and 1926	Typhoid Fever Incidence per 10,000, 1924, 1925 and 1926
		Privies	Water from springs and wells		
Group I Wards with more than 50% of population using privies (wards 12, 13, 16, 19, 20, 21, 23, 24, 25, 26.)	26,376	71.2	15.6	183	69.4
Group II Wards with from 15 to 49% of population using privies (wards 1, 2, 5, 14, 18, 22.)	18,707	26.0	5.0	87	46.5
Group III Wards with less than 10% of population using privies (wards 3, 4, 6, 7, 8, 9, 10, 11, 15, 17.)	50,380	6.2	2.0	197	39.1

* Exclusive of 2 cases not allocated because of incomplete address

The parallelism between the proportion of privies and the prevalence of typhoid fever as shown in Table V is striking. The same is true when the data for individual years are examined, save that in 1924 there was a slightly higher rate (23.3) in Group III than in Group II (19.8).

Since negroes quite generally suffer higher attack rates than do white persons the question arises whether the high rate of Group I may not be due to an excess of negroes in the population. This, however, is not the case, as the proportions of negroes in the three groups is estimated to be as follows: Group I, 11.5 per cent; Group II, 17.4 per cent, and Group III, 15.0 per cent.

With regard to the possible influence of polluted drinking water from springs and wells in causing the difference between these groups, it will be seen that the percentage of population using spring and well water as estimated from the school survey is closely correlated with

the proportion of privies and with the prevalence of typhoid fever in the several groups; being highest (15.6 per cent) in Group I, lowest (2.0 per cent) in Group III, and intermediate (5.0 per cent) in Group II. Therefore, the evidence in this table might be interpreted as indicating that the prevalence of the typhoid fever is closely related both to the use of privies and to the use of spring and well water; and it is difficult to distinguish between the two influences.

Some light may, however, be thrown on the question by a further analysis of the data relating to Group I. In five of the wards comprising this group (Wards 13, 19, 24, 25 and 26), more than 20 per cent of the population is reported as habitually using water from springs and wells, while in the other five wards (Wards 12, 16, 20, 21 and 23) less than 15 per cent, usually less than 10 per cent of the population, use water from such sources. A comparison between two groups of wards may be made as follows:

	A.	B.
	Wards 13, 19, 24, 25 and 26, in each of which more than 50 per cent of the population use privies and more than 22 per cent use water from springs and wells.	Wards 12, 16, 20, 21 and 23, in each of which more than 50 per cent of the population use privies, but less than 15 per cent use water from springs and wells.
Aggregate Population 1925	12,325	14,051
Per cent using privies	70.9	72.4
Per cent using water from springs and wells	26.3	6.0
Cases of typhoid fever:		
1924, 1925 and 1926	119	64
Cases per 10,000 of population:		
1924, 1925 and 1926	96.5	45.5

Although the two groups of wards differ very little with respect to the proportions of their populations using privies, they differ rather widely as regards the use of water from springs and wells; and the prevalence of typhoid fever has been distinctly higher in the group where spring and well water has been most commonly used. This simple fact, taken by itself, is perhaps not very significant; but when taken in connection with the fact that many of the springs and wells are obviously exposed to dangerous pollution, it strengthens the conviction that the practice of drinking water from springs and wells located within the city has been a factor of real importance in keeping up the high prevalence of typhoid fever in the city.

A similar study of the prevalence of typhoid fever among those who drink city water and those who drink well or spring water, is complicated by the fact that the same person may drink water from different sources, so that the population cannot be accurately classified with respect to sources of drinking water. Thus, the records of the cases

investigated in 1924 and in 1925 show that the sources of water stated to have been drunk by the patients within 30 days prior to onset were as follows: municipal supply, in 275 cases; local springs or wells in 83 cases; both municipal supply and local springs or wells in 79 cases; and other sources, chiefly bottled water, in 5 cases.*

According to the estimate based upon the school survey the number of persons in the city who habitually drink water from wells and springs probably does not exceed 6,050, that is, about 6.3 per cent of the entire population, yet from the above summary it appears that 83 out of 442 cases of typhoid fever, or 18.8 per cent, have occurred in this small fraction of the population. Again, if it be estimated that the people who occasionally drink water from local wells or springs are three times as many as those who habitually use these sources, then the total number in this class would be about 24,200, or approximately 25 per cent of the city's population. But the cases of typhoid fever who had drunk spring water either habitually or occasionally number 162, which is 36.6 per cent of the total cases. It is evident, therefore, that the population which drank water from local springs and wells has contributed an unduly large share to the cases of typhoid fever which have occurred in the city.†

SUMMARY AND CONCLUSIONS

From every angle from which the question has been investigated in the foregoing analysis the fact stands out clearly that in Knoxville typhoid fever has been most prevalent among those who are living in most intimate association with privies and unsanitary outdoor flush closets, and among those who most commonly drink water from wells and springs.

The relative importance of infection through polluted water from such springs and wells, as compared with conveyance by other means from insanitary privies cannot be precisely ascertained without a much more detailed investigation. In practice, however, it is not necessary to make such a distinction, for these two means of conveyance are not truly separate and independent but are closely related, in fact, interdependent.

These being the observed facts the obvious remedies are the extension of the public sewerage system and the abolition of privies; the repair and replacement of insanitary outdoor flush closets, and measures to condemn unsafe springs and wells. It has not been possible

* In 27 cases, the source of supply was not ascertained.

† In 1924 a quite severe localized epidemic occurred, principally in the 19th ward. Investigation pointed strongly, if not conclusively, to spread of the infection by one or more public springs in the locality, widely used by the population.

to effect a wide extension of the sewerage system but additions are being steadily made and the regulations with respect to connections to the sewers are being enforced, 1964 being effected in the years 1925 and 1926. Active measures have been and are being taken with regard to insanitary privies, more than 5,000 being made "fly-proof" in 1925 and 1926. Also many of the springs and wells in use in 1925 have now been permanently closed and efforts are being made to abolish all within the city limits.

A well balanced judgment of the effect of these measures must await further experience in this city and statistics for comparison with other cities. To the present, however, the results are distinctly encouraging. In 1926, although the morbidity was low, there were 20 deaths * reported, the death rate being approximately the same as in 1925. In 1927, to September 17, there have been only 58 cases reported, exclusive of those brought to Knoxville for treatment, with 6 deaths.

* Of these 20 deaths, 4 were among non-residents, and 2 are included in the notified cases of 1925.

ACKNOWLEDGMENTS: The writers are deeply indebted to the School Board and to the various principals and teachers for their assistance in the school survey and to the various members of the Nursing, Bacteriological and Sanitary Divisions of the Bureau of Health for assistance involving much overtime work, in both laboratory and field investigations. From Dr. W. H. Frost the writers have received much assistance and advice. He has also reviewed the manuscript.

IN JULY ISSUE—BACILLUS CALMETTE-GUÉRIN

B. C. G. enters into the discussion whenever public health workers gather. Few definite statements are made. Much of the comment is in the realm of probability due, no doubt, to the lack of English literature on the subject. S. A. Petroff, Ph.D., in his monograph *Bacillus Calmette-Guérin (B.C.G.) Animal Experimentation and Prophylactic Immunization of Children*, prepared in collaboration with Arnold Branch, M.D., which is to appear in the July issue of the *American Journal of Public Health and The Nation's Health*, covers the subject fully and demonstrates his conclusions by protocols from his own work. This article should be digested by all public health officials and will interest not only this group but the general practitioner of medicine as well.

C. C. Young

Tin Cans and Glass Jars as Bacterial Contaminants in Canned Foods*

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THERE are few references dealing with unused glass or tin containers as carriers of dirt and microorganisms though the study of dust and its composition has occupied the attention of such eminent pioneer investigators as Tyndall,¹ Pasteur,² Miquel³ and others. Frankland,⁴ Prudden,⁵ and Novy⁶ studied the microbiology of air and dust and together with Sternberg,⁷ Flemming,⁸ Jordan,⁹ and Conn¹⁰ demonstrated the presence of a varied microflora in air, dust and soil and pointed out the possibility of disease transmission by these means.

The dust which is found in tin or glass containers has settled largely from the air, though some contamination through contact with hands or machines may at times, likewise occur.

Experiments reported by the Hansen Machinery Corporation in coöperation with the Wisconsin Dairy and Food Commission¹¹ showed the presence of much invisible dirt in ordinary so-called "sanitary cans" previous to use. Visible dirt in cans and jars consists largely of fine soil particles, dust, coal-dust, soot, cinders, paper, grease, wood, lint and even nails, vermin excrement and insects. It is surprising how much of this debris can be found even in well stored and supposedly clean containers. Thompson¹² recommends dust-proof storage for cans and discusses proper methods and equipment for doing this. Several progressive manufacturers of canning machinery now list a number of can, jar and bottle washing machines, most of which do efficient work. Kilcourse¹³ cites very convincing data relative to glass sterilization and describes processes which have proved effective.

Few of the tin cans and only a part of the glass jars used for packing foods are washed or otherwise cleaned during the process of manufacture. For this reason there is ample chance for contamination of all kinds. Little attention has been given the matter by either sani-

* Read before the Food and Drugs Section of the American Public Health Association, at the Fifty-sixth Annual Meeting at Cincinnati, O., October 21, 1927.

NOTE: This investigation was begun in the laboratories of the Northwest Branch, National Canners Association, Seattle, and completed at the Massachusetts Agricultural Experiment Station, Amherst.

tarians or packers. Where there is visible dust, debris or other foreign matter in containers, it may be assumed that microorganisms are present. The purpose of this paper was to determine the numbers and types of the latter.

METHODS

Cans were obtained from 29 canneries and 3 container manufacturing plants. Seven of the canneries were located in Alaska and packed salmon exclusively. The rest were widely distributed in Washington, Oregon, New York and New England. Several samples of cans stored under different conditions were usually taken at the larger plants. The cans were all average samples of containers, no effort being made to collect particularly old, dirty or exposed cans. The can samples were closed on clean double seamers and shipped directly to the laboratory. Samples of containers direct from the 3 manufacturing plants also were examined. Glass jars and tumblers of various designs were obtained from 12 food products factories some of which also used tins. Caps were placed on the glass jars and tumblers at the factories before shipping to the laboratory.

Through a small hole aseptically made in the top of the can or metal capped jar, 50 c.c. of sterile tap water was inserted. After gentle agitation, the container was allowed to stand 10 minutes and after violent agitation the small hole being closed with sterile cotton, samples were withdrawn into suitable media. Plain and Czapek agar and gelatin plates were used for aerobes, liquefiers and molds, while dextrose and lactose broth, dextrose broth oil stratified and Rettger's egg-meat medium for anaerobes, were also utilized. Incubations were made at approximately 20°, 30° and 55°C., though a small part of the cultures were not incubated at the latter temperature.

EXPERIMENTAL RESULTS

In all 279 cans and 108 glass jars from a total of 35 different canning or container manufacturing plants, were collected and examined. All samples were collected during the summer months.

Representative sizes of cans and glass jars were obtained as far as possible. The number of cans and jars of each size which were examined and the average numbers of microorganisms found in each size are systematically arranged in Table II.

Table I shows in summarized form, the relative numbers of microorganisms occurring in cans and glass jars obtained at the canneries and ready for use.

NOTE: Acknowledgment is gratefully made to E. D. Clark, R. W. Clough, O. E. Shostrom, and W. H. Spaulding of the Northwest Branch, National Canners Association, Seattle, and to R. L. France of the Department of Bacteriology and Physiology, Massachusetts Agricultural College, Amherst, for assistance during the progress of this investigation.

TABLE I
SUMMARY OF RESULTS OF MICROBIOLOGICAL EXAMINATION OF UNUSED CANS AND JARS

Location of plants	Principal products packed	No of factories	No of can-tainers examined	Storage conditions	Percentage of plants with can wash equip	Aerobic micro-organisms per can or jar			Percentage of cans or jars containing			
						Bact	Molds	Yeast*	Anaerobes	Actinomyces	Thermo-philus (pre-sumptive)	Colon group
Alaska	salmon	7	69	fair to poor	0	6440	3270	87	79	41	72	4
Maine	fruits and veg	2	10	poor	0	2100	960	20	50	30	40	0
Massachusetts	fruits and veg	3	20	poor	0	2690	1040	10	70	35	35	0
New York	fruits and veg	2	8	fair	50	1510	900	12	75	75	50	0
Oregon	fruits, veg and salmon	3	36	fair to poor	25	54400	4300	67	100	33	83	3
Washington	salmon	12	104	fair	33.3	7130	5770	56	83	81	61	2
New York	can mfg factory	2	32	good		1410	250	6	25	6	46	0
Washington and Oregon	fruits and veg	7	67	fair	86	2240	2670	49	82	58	43	0
New York and New England	fruits and veg	5	29	fair to poor	100	7960	1100	20	44	37	11	0
West Virginia	glass factory	1	12	good		1450	320	0	58	58	16	0

TABLE II
EFFECT OF SIZE OF CONTAINER UPON THE NUMBER OF CONTAINED ORGANISMS

Trade No.	Approx capacity ounces	Approx area sq in	Average diameter inches	Ave No bacteria per container	Average No molds per container	Groups	Northwest canneries Number of cultures	Per cent	New England canneries Number of cultures	Per cent
1 lb tall	16.5	65	3.0	17,800	5,800	Cocci	102	28.6	111	27.6
1/2 lb flat salmon	8	36.3	3.4	24,000	4,900	Sporulating aerobic bacilli (including thermophiles)	67	18.8	45	11.2
1 lb flat salmon	16	67.8	4.0	27,800	3,230	Non sporulating aerobic bacilli	30	8.4	49	12.2
2 fruit	22.2	82.7	3.4	22,700	6,790	Anaerobes	9	2.5	7	1.7
2 1/2 fruit	32.6	119.3	4.0	33,000	6,300	Actinomycetes	19	5.3	32	8.0
10 (gallon)	116.1	408.8	6.1	43,100	9,200	Molds	79	22.1	103	25.8
Pint jar	16	77.7	3.0	4,300	2,600	Yeasts	20	5.6	23	5.7
Quart jar	32	156.0	3.9	5,200	3,000	Undetermined or doubtful	31	8.7	31	7.8
Vacuum tumbler	4	17.3	2.0	240	350					
Screw top tumbler	6	22.1	2.2	1,100	290					
Vacuum tumbler	8	27.0	2.3	3,170	2,130	Total	357	100	401	100

TABLE III
GROUP DISTRIBUTION OF MICROORGANISMS

Cans for Salmon—Cans were not washed previous to filling at any of the salmon canneries where samples were obtained. Some plants, particularly the larger ones in Alaska, manufacture their own cans early in the season and store them in the can loft for use after the salmon run begins. These cans may remain stacked several months, and occasionally even a year or more. Storage conditions for salmon cans ranged from poor to fair; few canneries used sufficient care in protecting their empty cans.

In general the one-half pound and one pound flats are shipped to the canneries in boxes or cases and are better protected than the talls. At most, burlap or tarred paper coverings are the rule in most canneries.

There was great individual variation among the cans tested both from the same and from different canneries. The maximum average count was 160,000 bacteria and 12,000 molds, from a cannery located on the Columbia River in a windswept, dusty region. Otherwise there is little variation in counts so far as locality is concerned. Some of the Alaska canneries showed very low counts, others fairly high. Though there is little dust (from soil) along the northwest and New England coasts, the very fact that humidity is high, possibly causes the cans to retain in viable condition whatever germ life does gain entrance.

Bacteria were more abundant than molds. The most common types of the former encountered were cocci, sporulating aerobes and actinomyces. The fungi were largely various species of *Penicillium*, *Mucor*, *Aspergillus* and others. Yeasts were always abundant. Thermophiles were usually present, but inasmuch as many of the common aerobic sporulating bacilli grow also at 55°C., too much significance cannot be attached to their presence here. They were not strictly differentiated in this study. Any organism producing growth at 55°C. was called a thermophile. Likewise any bacteria which grew in deep agar stabs or on agar plates incubated anaerobically with pyrogallol were considered anaerobes. Typical clostridia, though never numerous, were frequently encountered. The colon group as indicated by lactose fermentation was present in only 6 containers or 1.6 per cent of the total *Cl. botulinum* was not found in any of the cultures.

Microflora of Fruit and Vegetable Cans—In general, cans are shipped to these canneries in box cars or trucks packed either loose or in large crates. They are often loaded and unloaded by automatic can conveyor systems, thus eliminating much handling. It is likely that being more accessible to the can making plants, stocks of cans were not stored for such long periods as was found in salmon canneries.

The principal sizes used were Nos. 2, 2½ and 10. The diameter is greater in every case than that of the pound tall salmon can. The bacterial and mold counts are also higher. Here again great variations were found among the several samples, yet it is significant that the general averages of 19,200 bacteria and 5,390 molds per can for the Northwest and 2,300 bacteria and 7,000 molds per can for New England are really relatively high, and serious contamination of the food which enters the can may readily occur from this source.

Microflora of Glass Jars—Table I shows the summarized results obtained on glass jars from several northwest and New England canneries. Usually, glass container storage was found better than tin container storage, due largely to the fact that the glasses and jars come carefully packed and well protected, direct from the manufacturers. There is consequently, less danger of contamination than in the loosely crated or boxed tins. As stated before many plants receive their tins in full car lots, in which case they have very little protection from dust.

The bacterial and mold counts in nearly all glass jars tested were considerably lower than in the case of tin cans. It is significant that in this series the molds outnumbered the bacteria. Yeasts were very commonly found. In less abundance, were actinomyces, anaerobes and thermophiles. The leading bacterial groups found, as in tin containers, (Tables I and III) were cocci and aerobic sporulating bacilli.

In Table II it was attempted to correlate the numbers of bacteria and molds to the size of the container tested. To a certain degree this was successful. The cans harboring most microorganisms were the large No. 10's with the average of 43,000 bacteria and 9,200 molds. Next came the No. 2½ size with 33,000 bacteria and 6,300 molds. In general the flat salmon cans were dirtier and contained more molds and bacteria than the tall. The reasons for this aside from greater cross-section and area, are not clear. Likewise in the case of glass jars, the larger sizes carried the larger number of microorganisms. The jelly tumblers, though of small capacity, still harbored from 240 to 3,170 bacteria besides molds and yeasts.

GROUP DISTRIBUTION OF THE MICROORGANISMS

Data on the group distribution of the microorganisms isolated were obtained as a result of careful and complete examination of all colonies and cultures on all media, at 20°, 30° and 55° C. from a total of 20 cans obtained from 6 different canneries in the Northwest and 99 cans and glass jars from various New York and New England canneries. A total of 357 cultures from the northwest canneries and

the entire New England collection were grouped as follows:

The 213 cultures of cocci were further divided into 120 chromogenic and 93 colorless ones. Sarcinae were particularly abundant as were several species of orange and yellow micrococci. Only a few short chains of streptococci were observed. This group, so far as was determined, consisted largely at least of common air saprophytes. These settle into the cans along with dust particles and being relatively resistant to desiccation remain viable for a long time.*

The sporulating aerobes constituted the second largest group with 122 cultures or 14.8 per cent of the total. These organisms were of especial interest inasmuch as the same species were repeatedly found that had been previously recovered from insterile canned salmon " *B. cereus* was probably commonest with *B. vulgatus*, *B. mesentericus*, and *B. subtilis* also abundant. The greater heat-resistance of *B. mesentericus* may easily account for its relative abundance in canned foods as compared to other species of sporulating aerobes more numerous in dust and soil. The presence of spore forming bacteria in can dust in large numbers is probably explained on the basis of spore-resistance to desiccation, nearly all spores lodged in a can or jar thus remaining indefinitely in a viable condition. Seventeen facultative thermophiles are included in this group, 10 of which grew also at 30°C.

The asporogenous bacilli, in general, were short, non-characteristic rods most of which did not liquefy gelatin. Approximately one-fourth of the cultures showed chromogenesis. The presence of the colon group was indicated in only one case, where completed tests proved positive for *Escherischia coli*. Several cultures of *Aerobacter aerogenes* were recovered. *Ps. flouescens* was not commonly found in spite of the proximity to the sea of many canneries.

The anaerobes were the usual soil types resembling *Cl. butyricum*. No putrefactive types were isolated. None proved pathogenic or toxicogenic to guinea pigs. It is quite possible and even probable that *Cl. botulinum* is often present in dust and debris in empty food containers, particularly in the Pacific states where heavy soil infestation has been found." This should be a further incentive for canners to carefully wash their containers. Cans made inland and shipped to even remote salmon or other canneries, could thus infect the canned food, if the processing were insufficient to destroy the spores.

Actinomyces are always present in large numbers in soil and dust and are probably of little significance in this connection. Nearly all species are readily destroyed at 100°C. In certain products such as canned nut meats or dried foods it is possible that actinomyces might occasionally give rise to undesirable musty odors and tastes.

Molds are very abundant in can dust, the principal genera being *Mucor*, *Penicillium*, *Aspergillus*, *Rhizopus*, *Fusarium*, *Monilia* and others. They are probably incapable of causing injury to canned foods which are heated to the boiling point, unless the seams are not tight. However, molds are very important to jelly, jam, juice, syrup and soft drink manufacturers. Many cases of spoilage have been traced to improper sterilization of jars, bottles or caps. In some samples particularly of glass jars, the molds outnumbered the bacteria.

Yeasts are usually present in air and in dust; hence their presence in empty cans and jars is but natural. Like molds, they are usually incapable of withstanding 100°C. for more than a few minutes and are not of great importance in well processed canned foods. But as in the case of molds, yeasts in the empty jar or in the caps of jars or bottles of non-hermetically sealed foods, may cause fermentation and spoilage. Yeasty spoilage in improperly processed canned or preserved fruit products is of relatively common occurrence.

SUMMARY

Laboratory examination was made of 387 unused cans and jars from 35 northwest and New England canneries and container manufacturing plants. The counts ranged from a few hundred, to 162,000 bacteria and 22,000 molds per can in one cannery. Cans or jars obtained directly from the manufacturing plants harbored fewer microorganisms than the cannery samples. Container storage conditions ranged from very poor to excellent. In nearly all plants improvements could be made. In many canneries cans or jars were not washed previous to filling with food.

The principal groups of organisms found were cocci, 28.1 per cent; aerobic sporulating bacilli, 14.8 per cent; asporogenous bacilli, 10.4 per cent; anaerobes, 2.1 per cent; actinomyces, 6.7 per cent; molds, 24.0 per cent; yeasts, 5.6 per cent; and undetermined, 8.3 per cent. Thermophiles were relatively abundant. The colon group was presumptively present in but 1.5 per cent of cans or jars.

There was little qualitative or quantitative difference in the micro-organic flora of cans or jars from the Pacific or Atlantic seaboard.

The numbers of microorganisms per can increased directly with the diameter of the can. Fruit and vegetable cans on the average contained more bacteria and molds than salmon cans.

There is grave danger of introducing certain undesirable organisms such as *Cl. botulinum* and spoilage bacteria into the canned food by the use of dirty containers. Contamination of foods such as salmon

and sardines, not ordinarily harboring this organism, may thus be brought about.

The use of unsterilized jars, caps, etc. often leads to mold or yeast spoilage in jams, preserves, bottled goods, syrups, etc.

The presence of such a numerous and varied microflora in tin cans and glass jars ready for use at canneries of food products, makes it highly desirable that all containers be thoroughly washed before filling with food.

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Dr. Hideyo Noguchi Dies

DR. Hideyo Noguchi, world-famed scientist, who has been with the Rockefeller Institute for Medical Research in New York since the founding

of its laboratories in 1904, died at Accra, West Africa, May 21. He was a victim of yellow fever. He had been loaned to the Rockefeller Foundation by the Institute to go to Africa to study the relation between South American and African yellow fever.

Dr. Noguchi was born at Inawashiro, Yama County, Fukushima, Japan, November 24, 1876. In 1918, he served on the Yellow Fever Commission sent by the International Health Board of the Rockefeller Foundation to Guayaquil, Ecuador.

Among his achievements, Dr. Noguchi is credited with being the first to demonstrate *Treponema pallidum* in the brains of paretics and to transmit syphilitic infection to rabbits by means of brain tissue from persons succumbing to paresis, and for isolating the microorganism (*Bartonella bacilliformis*) from the blood of fatal cases of Carrion's disease.



Streptococcus as an Indicator of Swimming Pool Pollution

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THE behavior of bacteria in swimming pools although studied intensively during the past few years, is in need of further investigation. For many years, there was no well recognized procedure for testing for contamination and each bacteriologist devised his own methods of analysis with his own interpretation of what constituted dangerous water. The methods employed were generally based upon his knowledge of water bacteriology and hence were similar to, if not the same, as those which he employed in testing drinking water. Standards were developed by various individuals and later regulations concerning methods of procedure and standards were adopted by various states.

California, in 1917, was the first state to adopt regulations governing the operation of swimming pools. In 1919,¹ the California State Board of Health devised the following bacterial standard:

As a tentative standard, a total count of 1,000 colonies per c.c. on agar incubated at 37.5° C. and an Escherich's bacillus count of 1 per c. c. as set for the pool water in any part of the pool examined within 48 hours after sampling. All tests are to be made in accordance with the latest methods of the American Public Health Association.

During the years 1918 and 1919, the writer made daily examinations of the college swimming pool for the *B. coli* content and the total bacterial count to determine their value as indicators of pollution. In the course of this work, it was finally decided that with filtration and a reasonable amount of chloride of lime the *B. coli* content could be kept below 1 *B. coli* in five 1 c.c. portions and that the total bacterial count could be kept below 1,000 bacteria per c.c. This standard was adopted tentatively with the realization that it did not mean that water conforming to this standard was safe and that water not so conforming was dangerous. It was accepted merely because, under existing methods of purification it represented the highest quality of water obtainable from day to day. During the four years that this standard was in force, no cases of disease were traced to the swimming pools.

In 1923 a committee on bathing places,⁷ appointed by the American Public Health Association made the following report:

The committee is strongly of the opinion that the methods usually employed for bacterial analysis of potable waters do not show the true sanitary condition of the waters of the swimming pools. We wish at this time to emphasize strongly the need of studies of the bacterial flora of the waters of swimming pools as a basis for special methods for the sanitary analysis of such waters. Until such special methods have been worked out, we recommend that analysis be made according to the *Standard Methods of Water Analysis* of the American Public Health Association and that the following standards of quality be tentatively adopted

Sec. 5. Bacterial Count on Agar—2 days—20° C. (this count optional): Not more than 10 per cent of the samples covering any considerable period of time shall exceed 1,000 bacteria per c.c. No single sample shall contain more than 5,000 per c.c.

Sec. 6. Bacterial Count on Agar or Litmus Lactose Agar—24 hrs.—37° C.: Not more than 10 per cent of the samples covering any considerable period shall contain more than 100 bacteria per c.c. No single sample shall contain more than 200 bacteria per c.c.

Sec. 7. B. coli—Partial confirmed test: Not more than two out of five samples collected on the same day, or not more than three out of any ten consecutive samples collected on different dates to show a positive test in 10 c.c. of water.

The adoption of this tentative standard places swimming pool water on the same standard of quality as drinking water. This is justified on the grounds that bathers invariably swallow small amounts of water. As far as we know, swimming pools conforming to such a standard are safe in every respect, but unfortunately many pools fail to reach such a high degree of purity.

In adopting a standard using *B. coli* as an index of pollution it is well first to know that the microorganism indicates dangerous contamination. Is the swimming pool containing *B. coli* necessarily dangerous? Does the presence of *B. coli* indicate fecal contamination?

In drinking water, *B. coli* indicate fecal contamination, and water containing this microorganism is considered dangerous. In streams, lakes and wells, *B. coli* of fecal origin tend to decrease in number, due to adverse growing conditions. The amount of organic matter is limited and is not an available food for this organism. Further, the temperature of such water is relatively low and tends to discourage growth. In swimming pools, conditions are entirely different. A large amount of organic matter is present and in an available form for food. The temperature is high and encourages the multiplication of the bacteria present. It is possible under such conditions that *B. coli* would increase. They would thus cease to be indicators of pollution since they would tend to increase in numbers while the pathogens introduced in the fecal matter would tend to decrease and disappear altogether.

Under laboratory conditions, *B. coli* will grow abundantly in swimming pool water. Several years ago, the writer kept a culture of *B. coli*, recently isolated from feces, growing in sterile pool water by transferring to a fresh flask of water each morning from the preceding flask. At the end of 2 weeks, the last flask after 24 hours incubation, had a count of approximately 200,000 *B. coli* per c.c. Would *B. coli* grow in the swimming pool where other bacteria are present, where the pool is constantly receiving fresh pollution, and where a constant inflow of fresh water containing chlorine occurs?

In order to answer this question, a study was made of *B. coli* in the swimming pool. Before studying the behavior of *B. coli* in swimming pool water, the writer studied the flora of polluted swimming pool water, hoping to find other microorganisms indicative of body pollution. The microorganisms besides *B. coli* most commonly found were staphylococcus and streptococcus which were undoubtedly introduced into the pool by the bathers. Streptococcus was found in four pools studied. Practically every sample of water that was polluted with *B. coli* contained streptococcus.

This microorganism is used by the English for detecting pollution in drinking water. The Americans have never used this organism for testing drinking water because a negative test does not mean that the water is potable, although a positive test for streptococcus does indicate to a greater extent than one for *B. coli* that the water is unsafe. Its significance in swimming pool water was worth considering.

Last year (1925), all of the routine examinations made on swimming pool water included a test for streptococcus along with the usual *B. coli* test as recommended by the American Public Health Association. The present paper deals with the occurrence of these two microorganisms and the relation of both to the amount of pollution entering the pool.

QUANTITATIVE PROCEDURE

The method of procedure for measuring the number of streptococci is quite similar to the methods used by the English in the determination of streptococcus in drinking water. Glucose and lactose nutrient broths are used. Quadruple strength broth is used for volumes of water from 50 to 100 c.c., double strength broth for volumes from 5 to 50 c.c. and single strength broth for volumes of 1 to 5 c.c. of water. Ten c.c. of broth is placed in each tube. The following amounts of water are tested: 10 tubes containing from 1 to 10 c.c. varying by 1 c.c., 9 tubes containing from 20 to 100 c.c. varying by 10 c.c. each, 5 tubes containing 10 c.c. each and 5 tubes containing 1 c.c. each. The five 10 c.c. and five 1 c.c. samples are tested with lactose nutrient broth while the remainder

are tested with glucose broth. The broth is made according to the methods recommended by the *Standard Methods for Water Analysis*, 1925.

The tubes are incubated for 48 hours at 37°, readings being made for *B. coli* at the end of 24 hours' and 48 hours' incubation. At the end of 48 hours' incubation at 37°, the tubes are removed and kept at room temperature for 3 days to allow the streptococci to settle to the bottom of the tubes. The tubes may be centrifugalized at the end of 24 to 48 hours' incubation to throw down the streptococci. However, as the former method is more accurate and less difficult, it was adopted.

After the streptococci have settled to the bottom of the tube, the supernatant fluid is removed carefully by suction, leaving the precipitated bacteria in the bottom of the tube in the form of a thick creamy mass. A loopful of this thick mass of bacteria is smeared on glass slides, dried and stained with gentian violet. The smears are then examined under the microscope for streptococci. No attempt is made in routine procedure to isolate the streptococci. When isolations are made, blood agar plates are smeared with the sediment obtained by centrifugalizing tubes incubated for 24 to 48 hours. Pure cultures can be readily picked from these plates after 24 hours' incubation at 37° C.

RESULTS

The data presented represent for each day, the total number of tubes containing *B. coli* or streptococci considering all of the tubes tested, namely five 1 c.c. portions, five 10 c.c. portions, 10 portions ranging from 1 to 10 c.c., each portion varying from the preceding one by 1 c.c., and 9 portions ranging from 20 to 100 c.c., each varying from the preceding one by 10 c.c. amounts, making in all twenty-nine tubes containing collectively 550 c.c. of water. The data represent days when the swimming pool water had a high bacterial content which continued for 2 or more days. These periods were selected because the *B. coli* content was generally high in the evening and thus there was presented an opportunity to study the behavior of the microorganisms during the night when the only means of purification was circulation of the water through the filters. The morning samples were generally taken before the chloride of lime was added.

A. *A Study of the Pool When in Use*—A study of the *B. coli* and streptococci content of the swimming pool was made, taking samples hourly, when the pool was in use. During this period no chloride of lime was added, so the effect of the accumulated pollution could be measured by the *B. coli* and streptococci introduced by the bathers. During the morning, when there were only a few bathers in the pool, a

marked reduction of the streptococci occurred, which was paralleled somewhat by the decrease of the *B. coli*. In the afternoon, the attendance was larger and the number of streptococci increased until in the case of the 10 c.c. portions, all 5 tubes contained streptococci. The *B. coli* content did not increase to any extent; in fact, a slight decrease occurred in the three cases reported. In these cases, the increase of streptococci parallels the increase in pollution. These experiments were repeated several times with similar results.

B. *A Study of the Pool When Not in Use*—In this series of experiments a similar test was made, only over a longer period of time and represents a period when the pool was in use followed by a period when it was not in use. Single samples were collected on a Thursday night, Friday morning and night and then starting Saturday morning, a sample was taken every 3 hours throughout the day, that night and all day Sunday. No chloride of lime was added during the whole period of the test, the only means of purification being filtration which was used continuously. *B. coli* content increased materially during Thursday night and the streptococci content decreased to zero, i.e., no streptococci were found in any of the tubes. During Friday, when the pool was in use, streptococci increased to a greater extent than the *B. coli*. Friday night, both the *B. coli* and streptococci content dropped and continued to fall until 3 o'clock Saturday afternoon, when the pool was again in use. At this time, the streptococci content increased decidedly while only a slight increase of *B. coli* occurred. Shortly after, the number of streptococci decreased rapidly and at 9 o'clock Sunday night, they had practically disappeared. *B. coli*, on the other hand, although the number decreased, were still present in large enough numbers to represent a dangerous condition of the pool as indicated by the standard test. This experiment was repeated several times with similar results.

C. *Behavior of B. coli and Streptococci During the Night*—These data represent the changes occurring in the *B. coli* and streptococci content of the swimming pool during the night. Samples were taken in the morning before chloride of lime was added. In practically every case, the streptococci content dropped from a large number to a relatively small number in the morning. The *B. coli* content was more or less erratic; however, there was little or no decrease during the night, despite the fact that during the night the filters were in continuous operation. The average decrease of streptococci amounted to 66.5 per cent while in the *B. coli*, the average decrease was only 0.6 per cent. This indicates that the *B. coli* must have multiplied in the pool, for the filters remove a large number of microorganisms and would thus have

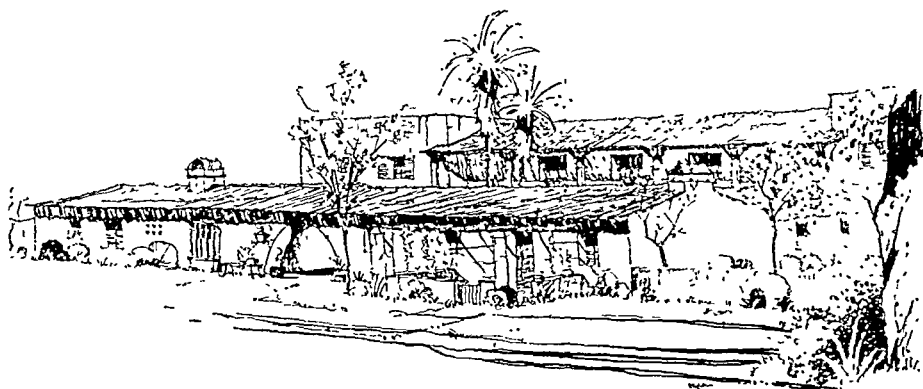
caused a marked reduction in numbers unless the organism actually reproduced in the pool. The reduction of streptococci, on the other hand, indicates that they do not grow. The data do not necessarily indicate that they die out in the pool, since they may be removed by filtration, but the data do prove that the streptococci content parallels the pollution.

CONCLUSIONS

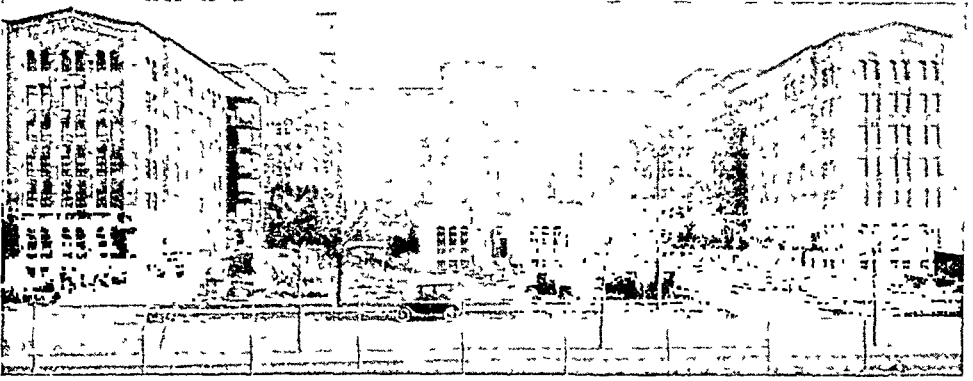
1. *B. coli* content is not a universally reliable indicator of intestinal pollution in swimming pools.
2. Streptococci are constant indicators of intestinal pollution and the number found in the pool parallels the amount of pollution as indicated by the number of bathers.
3. *B. coli* tend to multiply in the swimming pool, while streptococci do not.
4. Streptococci when present indicate an unsafe condition of the swimming pool.
5. *B. coli* do not necessarily indicate pollution or danger, although the absence of *B. coli* is an excellent index of safety.

REFERENCES

1. Gillespie, C. G. (1919) *Sanitation of Swimming Pools*, Special California State Bd. of Health.
2. Report of Committee on Bathing Places. (1923) *A. J. P. H.*, 14, 7:597 (July), 1924.



Santa Monica Health Center, Los Angeles County, California



Herman Kiefer Hospital, Detroit, Mich.

THE new unit of the Herman Kiefer Hospital, being constructed at a cost of 3 million dollars, will offer several unique innovations in the arrangement and management of a city hospital. The Herman Kiefer Hospital is operated by the Detroit Health Department and when the new unit is open for occupancy in October, adding 500 beds, the hospital will accommodate 1,100 patients. This hospital is used entirely for the hospitalization of cases closely associated with the work of the city health department. Acute contagious diseases and certain types of tuberculosis are taken care of there. A maternity service is also operated which forms a connection between the prenatal and infant welfare divisions of the Health Department.

There will be no wards in the new unit and not more than 2 patients will be accommodated in a room. Each room will be supplied with running water and there will be several bathrooms installed on each floor.

The new health department laboratory will occupy one entire wing on the first floor, and certain services, such as media preparation, etc., will be provided for in the basement. This laboratory, promising to be one of the best equipped public health laboratories in the country, will be in charge of Prof. John F. Norton, now of the Department of Bacteriology, University of Chicago. Professor Norton succeeds Dr. Roy W. Pryer, who recently resigned.

Also on the first floor of the new unit will be the main tuberculosis clinic of the Health Department and the clinic of the Division of Cancer Control, which was organized more than a year ago.

The top floor will be devoted to surgery and heliotherapy departments. There will be 4 major operation rooms and 2 heliotherapy departments. The heliotherapy departments, located at either end of the building, are divided into 3 divisions, the first for treatment by artificial light, the second where patients will be exposed to the sun through quartz glass, and the third for treatment by direct exposure to the sunlight.

When the new unit is opened, visitors will be asked to leave their street garments in a gown room and before entering a patient's room will be provided with sanitary and sterilized gowns to cover their clothing. This system will be inaugurated by hospital authorities with two objectives in mind—to minimize the opportunity of the importation of infection, and to remind visitors that they are in a hospital where the most minute details of sanitation are carried out.

EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

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HELP RECTIFY A LONG STANDING WRONG

OF more than usual interest is the Copeland-Wainwright Bill now before Congress. It is designed to acknowledge in a substantial way the services of those who took part in the yellow fever experiments conducted by the board of which the late Dr. Walter Reed, of the U. S. Army, was Chairman. Of this board, only a single member is now alive, one—Dr. Lazear—having died of yellow fever in Cuba, and another—Dr. Carroll—having suffered a severe attack of the disease from the effects of which he never entirely recovered. Walter Reed died of appendicitis, but this does not lessen the credit due him for having experimented upon himself, and does not take away from the country the obligation of making adequate provision for his widow.

We make no invidious distinction in saying that the private soldiers, who underwent experiments requiring a greater degree of courage even than going over the top, deserve especial credit. Some of them have frequently been mentioned and are fairly well known, but only recently, through the efforts of the American Association for Medical Progress, another name unknown to most of us has been added. Dr. Reed said: "In my opinion this exhibition of moral courage has never been surpassed in the annals of the Army of the United States."

The bill in question not only provides for a pension of \$250.00 a month for the widows of three of the members of the original board, and for the fourth—Dr. Agramonte—who escaped infection, but also for the soldiers who allowed themselves to be experimented upon. The bill also empowers the Smithsonian Institute to make recommendations to Congress in similar cases in the future, and awards of different types may be given.

In almost any other country in the world, such conduct would have been promptly and adequately rewarded, but our government has allowed more than twenty-five years to pass with practically no recog-

dition of the great services rendered, which resulted in the elimination of yellow fever, the saving of thousands of lives of our citizens and the addition of millions of dollars worth of commerce during the summer months. Legislation of this character was strongly urged as early as 1906, but beyond a meager pension to one or two persons, nothing has been done. At present, several of those who carried out the most courageous experiments are suffering and in actual physical want. We urge on our readers that they write to members of the Senate and House Committee on Military Affairs and to their Senators and Congressmen urging as strongly as possible the favorable consideration of the bill now before Congress.

NEW LIGHTS ON MOONSHINE

AS in politics, so in medicine and public health does the question of alcohol seem to have the power of constantly coming to the front under new phases. Three recent articles¹ present to the average reader a new point of view concerning bootleg or moonshine liquor.

There seems to be no question that methyl alcohol has been used to dilute the illegal product, and to this poison many cases of blindness and of death have been attributed. The poisonous effects of methyl alcohol are well proved. Methyl alcohol is not now so much in evidence, if we accept the findings in the State of Massachusetts as representative of the illicit trade for the country in general, justification for which is at least indicated in one of the articles referred to. Lythgoe, Director of the Food and Drug Division of the Massachusetts Department of Public Health, gives the results of a long series of analyses of illicit liquors. In 1926 and 1927 only a very small percentage contained methyl alcohol, and in practically all of these the amount was small. The average amount of ethyl alcohol in samples seized during 1921, and those collected in 1927, is almost the same, differing only by 0.02 per cent, but there is a general tendency in the more recently collected samples to a lower alcoholic content, the trend being to run between 24 and 35 per cent, whereas in 1921, a larger percentage of samples ran between 35 and 50 per cent.

The studies by Dr. Reid Hunt, who examined one hundred samples of illicit liquor furnished to him by the Department of Public Health of Massachusetts, gives results which will doubtless be surprising to many. He found that the only poisonous substance of any significance was ethyl alcohol, and that the poisonous properties of samples ran closely parallel to their content of ethyl alcohol. He states that he knows of no analyses or experiments which indicate that any substances are present in illicit liquor which are more poisonous than ethyl

alcohol itself. In three cases in which death was attributed to "poison whiskey," no poison was found, but in two, more than 60 per cent, and in one, 80 per cent, of ethyl alcohol was present. In other words, death occurred from ethyl alcohol in large doses.

Another most interesting finding is that ethyl alcohol which contains a certain amount of methyl alcohol is less poisonous than pure ethyl alcohol of the same strength. He points out that methyl alcohol has a weaker action on the higher nerve centers. He also found that genuine "bottled in bond" whiskey, and whiskey of approved "medicinal quality" were slightly more toxic than ninety-seven of the hundred illicit liquors supplied to him. In the three samples excepted, the greater toxicity was due to the higher content of ethyl alcohol.

He concludes that the question is one of ethyl alcohol rather than of good or bad liquor, and that "good grain alcohol" is the substance which causes acute poisoning and death, this statement applying with equal force to the illicit product and the so-called medicinal whiskey.

He points out further that substances distinctly more dangerous than methyl alcohol have been proposed as substitutes for ethyl alcohol in food products, just as the revenue laws some twenty-five years ago led to the substitution of methyl alcohol with disastrous results.

Ethyl alcohol occupies a unique position in respect to the animal body. It is practically the only known substance foreign to the body which in moderate amounts is easily and quickly rendered harmless, the body being able to make use of ethyl alcohol while destroying it. Dr. Reid says: ". . . Entire nations derive as large a part of their food from alcohol as from meat and other sources of proteins."

The Commissioner of Health of Massachusetts comments on the two articles considered, asking why the death rate from alcohol has increased so tremendously since 1920. The answer does not seem entirely clear, but one reason is suggested which accords with observations made by many. As he puts it, the tendency is to "drink it while you've got it." Observations made in parts of Canada where liquor is now legally sold, indicate that, during the period of prohibition, the habit of drinking light wines and beer was lost, and although these may now be obtained, strong drink is preferred by many. The same thing is probably true for the United States. When there is difficulty and legal danger in obtaining alcoholic beverages, the average man is inclined to get the most kick possible for his money, and to get it as quickly as possible. Unfortunately the kick is often in a vital spot, and of such force as to end in death.

REFERENCE

1. *New England J. Med.*, Mar. 22, 1928.

THE CONFERENCE ON PUBLIC HEALTH

IN 1927 the trustees of the American Medical Association called a Conference on Public Health, the result of which encouraged them to call a second conference in 1928, on March 30 and 31, at the headquarters in Chicago. The attendance was fairly large and included representatives from many organizations interested in the promotion of public welfare.

The program for the first day included only two subjects—Free and Part Pay Clinics, and The Health Demonstration. The papers of those who discussed these questions were ably prepared and unquestionably produced a profound impression on the audience. The discussion which resulted, however, was confined largely to the demonstrations held at Mansfield, O., and in Cattaraugus County, N. Y., and developed considerable heat. As one who took part said, many such discussions “result in much heat, but little light.” Unfortunately the discussion of the Cattaraugus County situation was limited to one side, since there was no one present to answer for the physicians concerned, some of whom were handled in rather severe fashion. The Health Demonstration, which was a masterly presentation of well planned and well conducted enterprises in four widely separated parts of the country, received practically no discussion, the two first mentioned cases having absorbed practically the entire attention of those who wished to talk and to be heard.

On Saturday a study of 3781 surveys was given. These included practically every type of survey, carried out by many different agencies, in practically every state of the Union. The speaker gave the impression that he was not very favorable to surveys as they have been conducted in the past, because there was little uniformity in objectives or accomplishments. Why surveys should be uniform in these respects was not shown.

There can be little question that friction has developed over health demonstrations given by private agencies; there has been lack of judgment on the part of some promoters as well as those employed in conducting the demonstrations. The nurses employed have been charged with prescribing, and with making statements which directly or indirectly discredited the medical profession of the community. The Health Commissioner of New York City is reported as having said that these privately conducted demonstrations were “sapping the strength of the official health body.” The president of the Ohio State Medical Association, who read one of the papers in the conference under discussion, was strongly of the opinion that such demonstrations were apt to lead to lack of self-respect, communism and state medicine,

in addition to discrediting the medical profession, which, he said, must always of necessity lead in such work.

The law has wisely put the medical man in charge of health matters practically everywhere, and there should be no competition with the medical profession. On the other hand, medical men acknowledge freely the assistance of those outside of the profession. They cannot, for example, forget the services of Pasteur, Chadwick and Shattuck, but it seems clear that the average man who has not been trained in the study of disease, and has not come into actual contact with it, cannot understand, and probably never will, the attitude of the man who has made it his life work.

Shortly before the conference adjourned, a better spirit was shown by those, the tone of whose discussions had been perfervid. It was agreed that both parties were equally honest and sincere, while both had the same ultimate object in view. It was finally decided that a committee be appointed, made up of members of the various organizations represented, which will discuss the entire matter in an effort to crystallize the spirit of coöperation, to agree upon fundamentals by which a better understanding may be reached, and plans for coöperative work in localities be made. The members of this committee are to report to their constituent organizations as well as to the board of trustees of the American Medical Association. We can only hope that good results will follow.

LETTER TO THE EDITOR

TO THE EDITOR:

I have read with much interest and with great satisfaction the article entitled, "New York Leads the Way," which appeared in the April number of your JOURNAL.

It is fitting that I call attention to the fact, that a Division of Public Health Nursing has been functioning in the Boston Department of Health since March, 1926.

All of the nurses are under the direc-

tion of Miss Hazel Wedgwood, a highly qualified nurse who has been efficiently developing a generalized nursing service. Our plan and method of operation have been discussed with Dr. Harris.

You will perhaps care to call attention to our nursing organization in a future number of the JOURNAL.

F. X. MAHONEY,
Health Commissioner.

Boston, Mass.,
April 23, 1928.

ASSOCIATION NEWS

THE AMERICAN PUBLIC HEALTH ASSOCIATION IN CHICAGO

WHAT promises to be the most stimulating meeting from the professional and scientific standpoints in the history of the A. P. H. A. is the 57th Annual Meeting to be held in Chicago, Ill., October 15-19, with headquarters at Hotel Stevens.

A departure from the usual procedure in former years will be the participation of two other national health organizations, the American Child Health Association and the American Social Hygiene Association, who will meet jointly with the A. P. H. A. This will be the 5th annual scientific meeting of the American Child Health Association, and a special meeting of the American Social Hygiene Association.

Other related organizations meeting in Chicago that same week will be the State Laboratory Directors and the Conference of State Sanitary Engineers.

In planning the program, the Central Program Committee has increased the number of days of the meeting in order to give more time for the inspection of Chicago's many points of interest. There will be a total of 42 sessions including 3 general sessions, 31 sessions of the sections and 4 special sessions devoted to: Cancer, Training for the Public Health Profession, Dairy Products, and Epidemiology; 4 joint sessions bringing together these sections: Health Officers, Public Health Nursing, Child Hygiene; Laboratory and Food, Drugs and Nutrition; Laboratory and Public Health Engineering; Child Hygiene, Public Health Education, and the Health Education Division of the American Child Health Association. Only the tentative program is submitted here to our readers.

GENERAL SESSIONS

At the first general session to be called Monday evening at 8:30 o'clock, an address will be made by Herman N. Bundesen, M.D., President of the A. P. H. A., and a similar address from the American Child Health Association. The second general session scheduled for Wednesday evening will be devoted to discussions of the following: "Our Organizations for the Care of the Sick," "Which Public Health Procedures Pay?" and "How To Use Effectively Civic Groups in Promoting Health Programs." These subjects will be presented by eminent authorities in the field of public health. The third general session, scheduled for Thursday evening, will be in charge of the Local Committee when a banquet will be held, followed by dancing.

SPECIAL SESSIONS

As one of the special sessions the Committee on Training and Personnel has arranged a dinner meeting to discuss "Minimum Training for All Persons Entering the Public Health Professions." Prof. C. E. Turner of Massachusetts Institute of Technology will preside, and the discussion will be opened by John Sundwall, M.D., director of Hygiene and Public Health, University of Michigan.

JOINT SESSIONS

The program arranged for the joint session of HEALTH OFFICERS, PUBLIC HEALTH NURSING and CHILD HYGIENE SECTIONS in conjunction with the American Child Health Association is: Studies on Infant Mortality. GEORGE T. PALMER, Dr.P.H., and

DOROTHY F. HOLLAND, Ph.D., American Child Health Association, New York, N. Y.

Discussion: PHILIP VAN INGEN, M.D., New York, N. Y.

Pediatric Service in the City Health Department Centers Provided By Medical Schools in Boston. HAROLD C. STUART, M.D., School of Public Health, Department of Child Hygiene, Harvard University, Cambridge, Mass.

Result of the 1927 Summer Round-Up Campaign of the National Congress of Parents and Teachers.

Symposium on Preschool Health Supervision Procedures to Reach the Children and Maintain Supervision

In the Small Towns and Rural Areas by a State Health Department (New York State Department of Health), ELIZABETH GARDINER, M.D., State Department of Health, Albany, N. Y.

In a Small City (Fargo, N. D.). LESTER J. EVANS, M.D., Medical Assistant, Child Health Demonstration, New York, N. Y.

In a Limited Area of a Large City (East Harlem Health Demonstration). GRACE L. ANDERSON, R.N., East Harlem Health Center, New York, N. Y.

The subjects and speakers for the joint session of the LABORATORY and FOOD, DRUGS and NUTRITION Sections are:

The Use and Interpretation of the Hydrogen Ion Determination in Food Control. W. A. TAYLOR, M.D., LaMotte Chemical Products Company, Baltimore, Md.

The Disinfection of Carbonated Beverages and Water Containers. JAMES P. KILCOURSE, Chief Bureau of Inspection, Department of Health, Chicago, Ill.

Research in Sewage and Industrial Wastes Disposal will be the main topic for the consideration of the LABORATORY and PUBLIC HEALTH ENGINEERING Sections at their joint sessions when the following papers will be presented:

Some Bio-Chemical Factors in Sewage and Sludge Treatment. WILLEM RUDOLFS, Director New Jersey Experiment Station, New Brunswick, N. J.

Experiments on Stream Flow Aeration in the Purification of Beet Sugar and Packing House Wastes. MAX LEVINE, Ph.D., G. H. NELSON and HARRY N. JENKS, Iowa State College, Ames, Ia.

Bio-Chemical Oxidation of Phenolic Wastes. FLOYD MOHLMAN, Chief Chemist, Chicago Sanitary District, Chicago, Ill.

At a joint session of the CHILD HYGIENE and PUBLIC HEALTH EDUCATION Sections with the HEALTH EDUCATION DIVISION of the A. C. H. A. an "Analysis of Efforts to Date to Define Objective Standards in Health Education" will be given by JAMES F. ROGERS, M.D., U. S. Bureau of Education, Washington, D. C.

SECTION MEETINGS

Health Officers—This section will hold 3 sessions, one of which will be devoted to Rural Health work.

Laboratory—At the first session of this section reports of the section committees will be given. The second session will be devoted to a symposium on "Undulant Fever" and at the third session, five papers of general interest to the section members will be read.

Vital Statistics—Accidents will be the main theme of the first session of this section. This will embrace accidents in industry, in the home, and public accidents. The second session will be given over entirely to sectional committee re-

ports. The papers to be presented at the 2 remaining sessions are:

Extent to Which Residence Influences the Recorded Death Rates from Cancer. J. V. DEPORTE, PH.D., State Department of Health, Albany, N. Y.

Reallocation of Non-Resident Deaths. WILLIAM C. WELLING, State Board of Health, Hartford, Conn.

Relation of Climate to Tuberculosis. ROBERT BRUCE WATSON, Newark, N. J.

The Mortality from Diphtheria According to Place of Death. DONALD B. ARMSTRONG, M.D., Metropolitan Life Insurance Company, New York, N. Y.

Practical Use of Vital Statistics in the Establishment of Neighborhood Health Work in New York City. G. J. DROLET, Statistician in charge Research Service, New York Tuberculosis and Health Association, New York, N. Y.

Vital Statistics in Insurance. EDWIN W. KOPF, Metropolitan Life Insurance Company, New York, N. Y.

The Elimination of the Normal Seasonal Components in Obtaining Epidemic Cycles. G. E. HARMON, M.D., Western Reserve University, Cleveland, O.

Total Morbidity Data in New York City, 1866-1927. HAVEN EMERSON, M.D., Columbia University, New York, N. Y.

Public Health Engineering—Symposia on "Sterilization of Milk Utensils," "Shellfish Sanitation," and "Methods of Financing Water Supply and Sewerage Improvements," have been arranged by this section. The subjects of atmospheric pollution by smoke and odors, useless noises and their relation to public health, and school room ventilation and absenteeism will be taken up at

other sessions of this group. A practical problem to be presented at one of these sessions will be "Carbon Monoxide Pollution of Air in Chicago" by JOEL I. CONNOLLY, M. J. MARTINEK, and J. J. AEBERLY of the Chicago Department of Health. The engineers have also planned a dinner session and a luncheon business session.

Industrial Hygiene—Industrial hygienists attending the Annual Meeting will have an opportunity of hearing the most pertinent phases of industrial hygiene today discussed by prominent investigators and authorities. This section has planned 3 sessions for its members, one of which will be given over to section reports. The programs for the other 2 sessions will include:

Industrial Fatigue (Including Report of Committee on Industrial Fatigue). *Chairman*, EUGENE L. FISK, M.D., Medical Director Life Extension Institute, New York, N. Y.

Mortality Trends in the Industrial Population. LOUIS I. DUBLIN, PH.D., Statistician, Metropolitan Life Insurance Company, New York, N. Y.

Development of Reports on Occupational Mortality. WILLIAM M. STEUART, Director U. S. Census Bureau, Washington, D. C.

Discussion: L. R. THOMPSON, M.D., U. S. Public Health Service, Washington, D. C.; DEAN K. BRUNDAGE; EUGENE L. FISK, M.D., Medical Director Life Extension Institute, New York, N. Y.

Public Health and Medical Work in a Large Coal Company. D. J. KINDEL, M.D., Medical Director, The Consolidation Coal Company, Fairmont, W. Va.

Discussion: LLOYD NOLAND, M.D., Tennessee Coal, Iron and Railroad Company, Birmingham, Ala.

The Possible Relationship of Mu-

tual Benefit Associations to the Health of Employes. SETH L. BUSH, Crocker-McElwain Company.

Mobilizing Mutual Benefit Associations to Include Health Activities.

Discussion: MEYER BLOOMFIELD, Consultant on Industrial Relations, WILLIAM A. SAWYER, M.D., Rochester, N. Y.

Extension of Industrial Hygiene by Tuberculosis Associations in the United States. BERNARD S. COLEMAN, Executive Secretary Hudson County Tuberculosis League.

Discussion: WADE WRIGHT, M.D., Metropolitan Life Insurance Company New York, N. Y.; EMERY R. HAYHURST, M.D., Ohio State University, Columbus, O.

House Organs and Their Relationship to the Health of Employes. MEYER BLOOMFIELD, Consultant on Industrial Relations.

Health Education in an Industrial Plant. J. B. GIBSON, Director of Safety and Health, Western Electric Company, Chicago, Ill.

The Tuberculous Worker and His Placement in Industry. C. W. BERGQUIST, President Chicago Tuberculosis Institute, Chicago, Ill.

Discussion: E. B. HUNT; VOLNEY S. CHENEY, M.D., Armour & Company, Chicago, Ill.

For a luncheon session a round-table discussion on "Industrial Fatigue" has been planned.

Food, Drugs and Nutrition—This section will follow its usual procedure of devoting one session to business and sectional reports. The papers scheduled for the other session are:

Health Significance of Small Amounts of Metals. DR. J. S. MCHARGUE, Agricultural Experiment Station, Lexington, Ky.

Evaporated Milk—Its Preparation, Nutritive Value and Uses in the

Diet. DR. FRANK E. RICE, Executive Secretary Evaporated Milk Association, Chicago, Ill.

What We Should Strive for in Food Advertising. E. V. MCCOLLUM, M.D., Johns Hopkins School of Medicine, Baltimore, Md.

Ice Cream Control. DR. F. W. FABIAN, Research Associate in Bacteriology, State College, East Lansing, Mich.

Child Hygiene and American Child Health Association—The first session of the Child Hygiene Section will be a joint meeting with the American Child Health Association to discuss "Maternal Mortality." The report of the Section Committee to Study the Problem of Infant and Maternal Mortality will be given by JULIUS LEVY, M.D., Newark, N. J.

BLANCHE M. HAINES, M.D., U. S. Department of Labor, Children's Bureau, Washington, D. C. will make a report of the Children's Bureau Meeting held in Washington in the spring to consider maternal mortality.

LILLIAN R. SMITH, M.D., State Department of Health, Lansing, Mich., will lead the discussion of this subject.

CARL DAVIS, M.D., Secretary, Section of Gynecology, Obstetrics and Abdominal Surgery, American Medical Association, Milwaukee, Wis. will give a report of that section, and WILLIAM DANFORTH, M.D., American Gynecological Society, Evanston, Ill., will preside at the discussion.

HAZEL CORBIN of the Maternity Center Association, New York, N. Y. will tell about the work being done by the Maternity Center Association in Tioga County.

"School Medical and Nursing Service" will be the subject of another session of the Child Hygiene Section. WALTER S. CORNELL, M.D., Director, Medical Inspection of Public Schools, Philadelphia, Pa., and Ann Dickie Boyd,

Director of Nursing, Bureau of Education, Denver, Col., will discuss the "Improvement of Measures for the Correction of Physical Defects." E. H. LEWINSKI-CORWIN, Ph.D. will discuss "School Medical Service in a Continuation School" and another speaker will be asked to present the part that the teacher must take in such a program.

The third session of the Child Hygiene Section will be for the consideration of "School Medical and Nursing Service." OTIS B. NESBIT, M.D., Director of Medical Inspection, Gary Public Schools, Gary, Ind., will talk on "Sickness and Absence Record in the School Health Program Methods and Procedures and the Values Resulting." and HAVEN EMERSON, M.D., Professor of Public Health Administration, College of Physicians and Surgeons, New York, N. Y., will lead the discussion.

The fourth session of the Child Hygiene Section and the A.C.H.A. will be devoted to Dental Hygiene. Objectives in dental health education will be the major topic. Clinics on dental health education material will be conducted by a school dentist and an educator.

Public Health Education—Last year this section found its luncheon discussion meetings most advantageous from several points of view and so again this year it will hold one dinner and two luncheon sessions for the informal discussion of successful procedures in health education, and for the exchange of ideas and accomplishments.

At one luncheon session, PROF. F. N. FREEMAN, University of Chicago, Chicago, Ill., will make an analysis of letters sent to health editors, and at another luncheon session MARY L. HAHN, State Department of Health, Springfield, Ill., will give a "Program for Health Education Training in Teachers' Colleges."

"Fundamentals of a Health Education Program" has been selected as the

subject for the formal session of this section. H. E. KLEINSCHMIDT, M.D., National Tuberculosis Association, New York, N. Y. will discuss the "Choice of Objectives and Subject Matter in Preparing Health Education Programs." HOWARD W. GREEN, Secretary, Cleveland Health Council, Cleveland, O., will talk on "The Selection and Grouping of Audiences" and IAGO GALDSTON, M.D., New York Tuberculosis and Health Association, New York, N. Y. will discuss "Mental Attitudes."

Public Health Nursing—At this time the Public Health Nursing Section has not completed its program. The section will have 2 sessions, however, one being devoted to section reports, and another to the subject of "Staff Education" when AMELIA GRANT, R.N., Director, Bureau Public Health Nursing, New York City Department of Health, will speak.

AMERICAN CHILD HEALTH ASSOCIATION SESSION

A meeting of the Health Education Division of the A. C. H. A. is also planned to meet the needs of teachers, and will be built around the subject, "Basic Correlation in Classroom Teachings."

AMERICAN SOCIAL HYGIENE ASSOCIATION SESSIONS

The American Social Hygiene Association has prepared the following tentative program, the speakers to be announced later:

Luncheon Session

Administrative Problems Indicated by Venereal Disease Incidence Studies

Scientific Session

The Program for Syphilis Research in the United States

Public Session

The Progress of Social Hygiene and the Efforts of Official and Voluntary Agencies in this Connection

A. P. H. A. ASSISTS IN CHAUTAUQUA HEALTH PROGRAM

HEALTH from the personal and community viewpoints will be presented from the Chautauqua platforms of the Swarthmore and Redpath Chautauqua Circuits this summer in 289 towns in 15 states in the mid-eastern section of the United States. The Chautauqua health program was inaugurated by the Milbank Memorial Fund of New York and the National Community Foundation. The American Public Health Association, at the request of the Milbank Memorial Fund, has agreed to undertake a part of the organization and direction of the health education program. Coöperating in this plan will be the American Child Health Association, American Red Cross, National Tuberculosis Association, secretaries of state tuberculosis associations and state health commissioners of the states included in the circuits.

The states embraced in this Chautauqua health program are:

Indiana	Connecticut
Ohio	Massachusetts
West Virginia	New Hampshire
Kentucky	Vermont
Maryland	Delaware
New Jersey	Virginia
New York	Rhode Island
Pennsylvania	

Upon authorization of the Executive Board, the A.P.H.A. has appointed the following Committee on Chautauqua Health Program: S. J. Crumbine, M.D., Chairman; Donald B. Armstrong, M.D., Bertrand Brown, H. E. Kleinschmidt, M.D. and E. H. Marsh, M.D. This committee will direct the collection and use of material on public health to be used by the lecturers. One of the responsibilities of this committee will be to obtain detailed information concerning health conditions in the cities and towns to be visited by the lecturers, so that to a certain extent, the general public health principles can be applied to the specific problems of the communities.

It is the aim of the coöperating groups to give impetus to public health through the Chautauqua program so that the communities will themselves undertake some definite public health work. The committee also hopes to increase the scope of service of the local, state and national health organizations in relation to the individual community health programs.

Dr. Edward T. Devine, Dean of the Graduate School, American University, Washington, D. C. and Dr. David D. Vaughan, professor of Social Ethics of the Graduate School, Boston University, will be the speakers on community health for the Swarthmore Chautauqua, and Marie Dohm and Helen Stacey of the American Red Cross staff will be the lecturers on personal health.

On the Redpath Chautauqua Circuit, Wallace Bruce Amsbary of the Armour Institute of Technology, Chicago, Ill., and Frederick M. Snyder, social investigator of Lima, O. will be the two lecturers.

A program to interest the children of the community will be conducted by the Junior Chautauqua leader in each town. The special feature of the Junior Chautauqua program this year will be the presentation of a "Health Minstrel" prepared by Mary L. Flynn, director of Junior Work for the Swarthmore Chautauqua Association. The children will dramatize health principles at the meetings of Junior Town.

EMERY R. Hayhurst, M.D., Fellow A. P. H. A., Secretary of the Industrial Hygiene Section and a member of the Editorial Board, will represent the American Public Health Association at the Congress of the Royal Institute of Public Health, University of Dublin, Dublin, Ireland, August 15-20. He is one of the vice-presidents of the Congress and will read a paper on "Occupational Diseases."

He will also represent the Association

at the 5th International Medical Congress for Industrial Accidents and Occupational Diseases at Budapest, Hungary, September 2-8, and will read a paper on "Silicosis." He is joint chair-

man of the Committee for the United States of this congress, and one of the 2 permanent members of the International Committee, which position he has held since 1914.

NEW MEMBERS

Pedro José Alánzar, M.D., Montgomery, Ala. (Assoc.)

Philip K. Bates, S.B., Dayton, O., Research Worker on Food Preservation and Health, Frigidaire Corporation

William Roscoe Berry, Norfolk, Va., Chief Inspector and Bacteriologist, Bureau of Shellfish Sanitation, State Department of Health

Joseph Colt Bloodgood, B.S., Baltimore, Md., Chairman Maryland Cancer Committee

V. G. Bonham, M.D., Fayette, Mo., County Health Officer

F. F. Bowman, M.D., Madison, Wis., Health Officer

Esther L. Branch, Chicago, Ill., Lecturer on Education Subjects, The Best Foods, Inc.

Joseph T. Brennan, M.D., Independence, Mo., Health Commissioner Jackson County (Assoc.)

Russell Broughman, Orlando, Fla., District Sanitary Officer, Bureau of Engineering, State Board of Health

Harriet Brydon, New Lisheard, Ontario, Can., Victorian Order Nurse and School Nurse

Ora Ann Carl, Flat River, Mo., County Public Health Nurse

Manton M. Carrick, M.D., Dallas, Tex., Director of Public Health

Alice M. Childers, R.N., Farmington, Mo., County Public Health Nurse

Iva M. Church, B. S., Detroit, Mich., Nutrition Director, Detroit Dairy and Food Council

Margaret W. Davison, Maryville, Mo., County Public Health Nurse

Helen Louise Delano, R.N., Boston, Mass., Industrial Nurse, Boston Rubber Shoe Company

C. M. Derryberry, M.A., New York, N. Y., Research Assistant, American Child Health Association

Alva J. Drake, M.D., Lancaster, Mo., County Health Officer

Raymond E. Duckworth, D.V.M., Berkeley, Calif., Field Veterinarian, State Department of Agriculture

Helena A. Dunham, R.N., Kansas City, Mo., Supervising Nurse, Jackson County

John Engelbrecht, M.D., Stony Hill, Mo., County Health Officer, Gasconade County

Charles Hall Farmer, M.D., Lakeland, Fla., City Health Officer

Elisha Fowler, Reading, Mass., (Assoc.)

Royal L. Garner, M.D., Milan, Mo., County Health Officer

James Gibbard, M.S., B.S.A., Ottawa, Ontario, Can., Bacteriologist, Department of Health Laboratories

Edith Doris Hagerman, Beaver Falls, Pa., Industrial Nurse, Babcock and Wilcox Tube Co.

Philip Abbot Herrick, New York, N. Y., Director, Scientific Department, Merrell-Soule Co., Inc.

Louise K. Lauermann, R.N., Columbia, Mo., County Nurse

Camilla Laws, B.S., Chicago, Ill., with Calumet Baking Powder Company

James R. Lee, M.D., Charleston, Mo., County Health Officer

Elizabeth B. Lundy, A.B., New York, N. Y. (Assoc.)

Edith Hanson Marcham, R.N., Plainville, Conn., Industrial Nurse, Trumbull Electric Co.

James H. McCall, M.D., Moundsville, W. Va., City and County Health Officer

William Arthur McGraw, Flat River, Mo., Sanitary Inspector

L. B. McPheeters, Charleston, Mo., Sanitary Inspector

Ruth Esther Mettinger, R.N., Jacksonville, Fla., Nursing Field Representative, Georgia and Florida American Red Cross

Gertrude O. Murphy, R.N., Bonne Terre, Mo., County Nurse

Bertha E. Nettleton, New York, N. Y., Direc-

tor Research Department, Childs Company
 Ralph E. Noble, Chicago, Ill., Bacteriologist
 Chicago Health Department

Nellie Ogilvie, Bernardsville, N. J., Director
 Visiting Nurse Association of Somerset Hills

Charles Hewlett Peters, B.S., Kennett, Mo.,
 Sanitary Inspector Dunklin County

Anne Pierce, M.S., New York, N. Y., Editor
 Bureau of Chemistry, U. S. Department of
 Agriculture

Mabel L. Smyth, Honolulu, Hawaii, Director
 Division of Maternal and Infant Hygiene,
 and Supervisor of Nurses, Territorial Board
 of Health

Margaret Iglehart Stanford, R.N., Charleston,
 S. C., Staff Nurse, Public Health Nursing
 Service, Department of Health

Minnie Julia Strobel, Jefferson City, Mo.,
 Acting Director Public Nursing, Division of
 Child Hygiene, State Board of Health

Harry Taub, Ph.Ch., B.S., New York, N. Y.,
 Assistant Professor Materia Medica, School
 of Pharmacy, Columbia University

Euthimios H. L. Tchou-Baj-Oglu, M.D., New
 York, N. Y., Conducting public health work
 at tri-weekly clinics

Leonard O. Vose, B.Sc., M.A., Lincoln, Neb.,
 Director of Laboratories, State Bureau of
 Health

Katherine Z. W. Whipple, A.B., M.A., New
 York, N. Y., Secretary Extension and

Development Service, New York Tubercu-
 losis and Health Association

Edward Watson, Kansas City, Mo., Dairy
 Advisor

Sien Ming Woo, M.D., C.P.H., Shanghai,
 China, Post Graduate Study (Assoc.)

Alma Helena Wretling, R.N., Minneapolis,
 Minn., Director Hennepin County Public
 Health Nursing Service

Agnes I. Wright, Mount Vernon, N. Y., Direc-
 tor Mount Vernon Visiting Nurse Associa-
 tion

DECEASED MEMBERS

Arthur G. Bretz, M.D., New York, N. Y.
 Member, elected 1920.

Daniel Connelly, M.D., Health Officer, Kings-
 ton, N. Y. Member, elected 1927.

C. E. Durham, M.D., State Board of Health,
 Austin, Tex. Member, elected 1927.

Adam S. MacKnight, M.D., Bristol Co. Tuber-
 culosis Hospital, Attleboro, Mass. Fellow,
 elected 1923—Member, 1915.

F. C. Smith, M.D., Auburn, N. Y. Member,
 elected 1919.

Francis R. Smyth, M.D., Bismarck, N. D.
 Fellow, elected 1923—Member, 1912.

Margaret Tupper, R.N., The Rockefeller Foun-
 dation, Paris, France. Member, elected 1920.

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D.P.H.

Communicable Diseases in New York City—A grand total of 124,625 new cases of reportable diseases was notified to the New York City Health Department during the year 1927, as against 133,313 in 1926, and 95,222 in 1925.

Cases of venereal diseases were the most numerous of communicable conditions reported during 1927, there being 31,330 cases, of which 24,324 were syphilis, and only 7006 were gonorrhea. Scarlet fever came second on the list with 18,339 cases. This disease was much more prevalent than in the two previous years. There were 18,273 cases of pneumonia reported—a decrease of 7500 over 1926. Diphtheria furnished the fourth largest number of cases reported, 13,507 in 1927. Then followed tuberculosis with 10,873 cases. There were only 2101 cases of measles.

The above figures are compiled in a preliminary report issued by the New York Tuberculosis and Health Association, and as furnished by the courtesy of the Division of Communicable Diseases of the New York City Department of Health.—G. J. Drolet, *Prevalence of Communicable Diseases, New York City, 1927*.

Appraisal of Health Activities in Cincinnati—Figures gathered by Dr. W. H. Peters, Health Commissioner of Cincinnati, in which a comparison is made with 15 cities of larger population and 4 cities of slightly smaller population, show expenditures from 1 cent to 69 cents per capita higher than the current expenditures for Cincinnati. The latter city appropriated \$201,414.35 for public health work in 1927, which represents 49 cents per capita. With the

addition, however, of sums spent by other municipal and voluntary agencies engaged in public health work, the per capita expenditure rises to \$2.09.

Cincinnati scores 798 points out of the possible 1000 provided for by the *Appraisal Form for City Health Work* of the Committee on Administrative Practice of the American Public Health Association.

The milk and food control service of the Health Department is outstanding in personnel, direction and accomplishments. The annual summer round-up of preschool children has been an enterprise of marked success. The Public Health Federation brings together representatives of all public and private agencies in Cincinnati interested not only in preventive health work, but in the broad problem of health including dispensaries, hospitals, mental hygiene, etc. The vital statistics service of the Health Department is approximately 88 per cent adequate at the present time. There is need of a trained vital statistician.

The Health Department is responsible for the control of communicable diseases and measures instituted are in accord with best practice. Intensive immunization campaigns should be instituted and nurses should be employed for the educational instruction in connection with the control of communicable diseases. The Communicable Disease Division is given a rating of 78 per cent, while for the control of venereal diseases the community rating is 88 per cent. A more intensive follow-up system should be employed.

The tuberculosis services of Cincinnati are but 48 per cent adequate. Eight

agencies and the County Hospital assist the Health Department in providing control services. A full-time director of tuberculosis is needed, as well as additional funds for extension of nursing, medical, hospital and preventive services.

The prenatal service lacks but 17 per cent of being up to standard requirements. There is need of greater intensity of clinic service per case registered, and obstetrical nursing service should be offered to private physicians for home deliveries.

The infant hygiene service is 79 per cent complete, while the preschool service rates 100 per cent, and the school service 73 per cent.

There are 78 nurses doing public health nursing service under the direction of 10 separate and distinct agencies. The present nursing personnel is a little less than half the number required.

The sanitary work of the Health Department is well organized, lacking only 12 per cent of obtaining the maximum score, and the food and milk control services show a high degree of efficiency and receive a rating of 85 per cent of the maximum.

A full score is accorded to the laboratory, although the activities are divided among several public and private laboratories.

Popular health instruction is 70 per cent complete.

Cincinnati has made many noteworthy accomplishments in the field of public health, it being the desire to plan for a complete health program. The Out-Patient Department of the General Hospital carries a large service, a special thyroid survey among school children has been undertaken under the direction of Dr. Olesen of the U. S. Public Health Service.

Special clinics have been prepared for the negro, while the City Housing Bureau has made noteworthy progress in their particular line of endeavor.

An Appraisal of Public Health Activities in Cincinnati, Ohio, for the Year 1926, published jointly by The Public Health Federation of Cincinnati and the American Public Health Association.

Rural Health Service—On January 1, 1928, there were 414 counties in the United States with a local health service under the direction of whole-time local health officers. In 1924 there were 250 such health departments; in 1925 the number had increased to 280; in 1926 there were 307, and in 1927 there were 337. These figures all refer to the condition on January 1, in each year.

Within the period January 1, 1927, to January 1, 1928, whole-time county or district health service was established in 84 units and was discontinued in 7—a net gain of 77. In 64 instances the district was more or less inundated by floods in the Mississippi valley or in the Eastern part of Kentucky during the spring of 1927. There were created 18 new units in Arkansas, 22 in Kentucky, 16 in Louisiana, 5 in Mississippi, 2 in Missouri, and 1 in Tennessee. These projects have been developed under special arrangements between the various state health departments, the U. S. Public Health Service, and the Rockefeller Foundation.

Since 1920 the average annual net gain in the number of new county or district units has been 38. At such rate of progress about 55 years would be required for reasonably adequate whole-time local rural health service to be extended to such parts of the United States in which the service is needed. It is estimated that a reasonably adequate whole-time rural health service throughout the country would cost about 20 million dollars a year.—L. L. Lumsden, Extent of Rural Health Service in the United States, 1924-1928, *Pub. Health Rep.*, 43:861 (Apr. 13), 1928.

LABORATORY

C. C. YOUNG

SOME SEROLOGICAL STUDIES IN MALARIA*

WILLIAM H. TALIAFERRO, PH.D.

University of Chicago, Chicago, Ill.

THE serology of malaria has become a subject of intensive investigation for my coworkers and me because first, it forms an integral part of our program of studying the immunology of the blood protozoa¹ and second, it may yield a tool of prime importance in the diagnosis of the latent disease. As the members of the Association are primarily interested in the latter topic this paper will be limited to the bearing of the work on the question of diagnosis.

In spite of many valuable clinical aids the final and positive diagnosis of malaria rests upon the finding of the plasmodia in blood smears. The chances of finding the parasites have been greatly increased by the various modifications of the thick film method² first devised by Ross.³ Nevertheless, the perfection of some serological test might enable us to reach a final diagnosis of infections of such a low grade that parasites cannot be found in the thick film, and would be of interest in following the course of the disease during treatment.

Before we began our work there was considerable evidence that both precipitins and complement fixing antibodies could be demonstrated in a certain proportion of malarial cases. Omitting from consideration a long series of papers dealing with the Wassermann reaction or modifications of it, Gasbarrini,⁴ Thomson,⁵ and Horowitz-Wlassova⁶ obtained complement fixation and Powny⁷

obtained a precipitin reaction. In view of the comparative simplicity of technic we have been attempting to perfect a precipitin test and through the financial aid and courtesy of the International Health Board and the United Fruit Company we have made two trips to Tela, Honduras, to test our results under tropical conditions.⁸

By far the most difficult technical obstacle in work of this kind is the preparation of a suitable "antigen"[†] for the tests. In our first work at Tela we carried out 1605 precipitin tests with 37 different "antigens" on the serums of 535 persons. This was supplemented in our second trip by 1438 precipitin tests with 75 different "antigens" on the serums of 298 persons. All of the efficient "antigens" have been made with aqueous extracts containing large amounts of malarial protein. The best source of malarial protein has been from placentas of patients infected with *Plasmodium falciparum* where there is a placental localization of the parasites. In our first work⁸ we believed that infected peripheral blood, particularly after cultivation to increase the size of the parasites, might be just as efficient a source. Later work, however, did not bear this out as we have never obtained as good results with blood as with infected placentas. In comparing these two sources of malaria protein we concentrated the parasites from both blood

* Read before the Laboratory Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 21, 1927.

† The term "antigen" is used to designate the material used in the *in vitro* tests thus differentiating it from its strict usage to connote substances stimulating the production of antibodies in the animal body.

cultures and infected placentas by the method of Bass and Johns.⁹ The results indicate that a heavily infected placenta contains an unbelievably large concentration of plasmodia and yields a total amount of malarial protein far greater than can be obtained from cultures of peripheral blood.

The original method for preparing "antigens" from infected placentas which proved most satisfactory is as follows: The fresh placenta is minced in a meat chopper and added to an equal volume of ether. After extracting for several weeks in ether, the wet residue, i.e., ether insoluble portion, is added to an equal amount of Coca's extractive, consisting of an aqueous solution of 0.5 per cent sodium chloride, 0.05 per cent sodium bicarbonate and 0.4 per cent carbolic acid. After extracting for about one week the mixture is filtered through hard paper and the

however, half as much Coca's solution was added to the placental material, and the resulting mixture became quite acid. In consequence it was carefully adjusted to a pH of 7.8 before use. This stronger solution of proteins after adjustment of its pH was found to be more satisfactory.

The actual tests were made in small tubes about 4 x 50 mm. with a capacity of about 0.65 c.c. The patient's serum (.15 c.c.) was placed in the bottom of the tube and a like quantity of antigen layered on top. Positive reactions consisted of a "ring" of precipitate between the interplaces of the two liquids and appeared after an incubation of 1 hour at 37°C. and 6 hours sojourn at icebox temperatures. After some experience it was found satisfactory to limit the tests to two antigen dilutions—undiluted and 1-5. The final test consisted of four tubes as follows:

	Tube 1	Tube 2	Tube 3 (Control)	Tube 4 (Control)
	c.c.	c.c.	c.c.	c.c.
Patient's serum undiluted	0.15	0.15	0.15	0
Antigen	0.15 (undiluted)	0.15 (1-5)	0	0.15 (undiluted)
0.85 per cent NaCl	0	0	0.15	0.15

clear filtrate used as "antigen." The preliminary treatment with ether, possibly by increasing the permeability of the cell walls, was found to be quite necessary, but it is to be emphasized that only the ether insoluble portion was used in the preparation of the antigen. The resulting antigen was nearly neutral or slightly alkaline. In the second year's work,

Considering only the "antigens," prepared as described, we (Taliaferro, Taliaferro, and Fisher)⁸ tested 86 cases in 1926 and 64 cases (Taliaferro and Taliaferro)⁸ in 1927. The first series of tests consisted of serums from 54 infected persons, which gave 45 positive (10 + + +, 21 + +, 14 +), 2 doubtful and 7 negative tests; and

TABLE I
PRECIPITIN RESULTS (86 CASES) WITH AN "ANTIGEN" PREPARED FROM A HEAVILY INFECTED (*P. falciparum*) PLACENTA, EXTRACTED IN ETHER AND THE ETHER INSOLUBLE PORTION DIGESTED IN COCA'S SOLUTION

Results of blood examination	Precipitin Results					Total number of cases omitting	
	+++	++	+	+?	—	doubtful readings, giving:	
						positive precipitin test	negative precipitin test
Positive in thin or thick films	10	23	14	2	7	45	7
Negative in thick film		2	4	1	25	6	25

TABLE II

PRECIPITIN RESULTS (64 CASES) WITH "ANTIGENS" PREPARED SIMILAR TO THAT IN TABLE I FROM HEAVILY INFECTED PLACENTAS (*P. falciparum*), BUT ADJUSTED TO PH 7.8

Results of blood examination	Precipitin Results					Total number of cases (omitting doubtful readings) giving:	
	+++	++	+	+	—	Positive precipitin tests	Negative precipitin tests
Positive in thin or thick films	4	11	15	1	1	30	1
Negative in thick films	none	none	1	4	27	1	27

from 32 persons negative for malaria which gave 6 positive (2 +++ , 4 ++), 1 doubtful and 25 negative tests. The second series contained serums from 32 infected persons which gave 30 positive tests (4 +++ , 11 ++ , 15 +), 1 doubtful, and 1 negative; and 32 persons negative for malaria which gave 1 positive, 4 doubtful and 27 negative tests. There were fewer cases tested in the second series because we spent considerable time making multiple tests on each person in order to ascertain the effect of treatment and how long a given serum could be stored and still give a positive test.

Space will not permit a discussion of these results in detail but they will be published with the final data. Similarly we shall not discuss other antigens that were tried except to mention the fact that a very reactive one was made by first mincing an infected placenta in a meat chopper, then concentrating the malarial plasmodia by Bass and John's⁹ technic and drying the material over calcium chloride. To prepare the "antigen" for use this powder was extracted in N/20 HCl for 18 hours and just

before use the supernatant liquid was neutralized with N 20 NaOH. This method presents so many technical difficulties (chief among which is that the malarial plasmodia cannot be concentrated unless the placenta happens to be passed when the parasites are full grown), that we have centered our attention on the easier method already outlined. Throughout our work *P. falciparum* "antigens" have reacted quite as well with *P. vivax* serums as with homologous serums.

Much more work needs to be done. Undoubtedly the greatest single drawback now is the difficulty of obtaining infected placentas because placental localization is infrequent even when the mother is infected with *P. falciparum*. One placenta, however, yields enough material for hundreds of cases and our next experiments will be directed toward ascertaining how long our "antigens" can be preserved and still remain active. We also hope that by improvement of technic the reactions can be made considerably stronger and that a larger proportion of +++ reactions can be obtained.

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3. Ross, R. *Lancet*, 1:86, 1903.
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VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

Two Studies of the Causes of Stillbirths—These studies include about 500 cases of stillbirths reported in hospitals or homes in the Bellevue-Yorkville District of New York City, and 18,634 cases from selected sections of the birth registration area of the United States. The percentages of deaths from each cause in the birth registration area in 1924 were: prolapse and compression of the cord 9.1, diseases of the placenta and membranes 8.9, difficult labor 8.6, abortion, miscarriage and premature birth 8.2, malpresentation 5.3, albuminuria and other diseases of pregnancy 5.2, asphyxia of child 4.1, malformation 4.1 and syphilis 2.6. In the Bellevue-Yorkville District asphyxia of the child caused 15.1 per cent of the deaths, abortion, miscarriage and premature birth 13.7, diseases of the placenta and membranes 8.1, difficult labor 7.0, prolapse and compression of cord 6.8, toxemia and nephritis 6.7, malformations 3.0, syphilis 2.8, and malpresentation 1.2 per cent.

Analysis of 498 cases in the Bellevue-Yorkville District shows that 56 occurred at home and 442 in institutions. The relative frequency of hospital or institutional cases and at-home cases was about equal for asphyxia of the child, difficult labor, and death in uterus. Abortion, miscarriage and premature births were more than twice as frequent among hospital cases as among home cases. Diseases of the placenta and membranes are considerably greater, while prolapse and compression of the cord, toxemia and nephritis are but slightly higher among hospital cases. All stillbirths due to diseases of the

child, rupture of the uterus, hemorrhages, hydramnios, therapeutic induction of labor, inertia of uterus and extra-uterine pregnancy occurred among hospital cases. Malformations, syphilis, and injury to the child are greater among home cases. Other diseases of the mother such as influenza, high blood-pressure, traumatism and overwork are also greater in home patients. The causes due to conditions of the mother cover 202 stillbirths, those due to conditions of the child were 188 while 108 were due to conditions of mother and child.—Laura W. Nathan and Godias J. Drolet. *New York State J. Med.* 28:78-80 (Jan. 15), 1928.

New Haven's Health Record, 1927—In general, New Haven's 1927 record is favorable. This is shown by a lowered death rate from all causes (11.2 per 1,000 population), and by decreased sickness and deaths from certain communicable diseases. That no deaths occurred from typhoid fever, measles and whooping cough is indeed noteworthy. There were no cases of small-pox either in the city or the state. Despite a rise in diphtheria in different sections of the country the incidence of this disease remained low in this city, there being only 3 deaths attributed to this cause, a rate of 1.6.

In 1927, 4,457 children were immunized against diphtheria, so that now over 75 per cent of the school children and 25 per cent or more of the preschool children are known to be protected from this dreaded disease.

The infant mortality rate in 1927 was 54 per 1,000 live births. A steady

decline has taken place in the tuberculosis death rate, from 57 in 1926 to 49.2 in 1927.—New Haven Department of Health. *Monthly Bull.* 55:3-4 (Jan.), 1928.

Public Health in the District of Columbia—Infant and maternal mortality in the nation's capitol have been studied by the U. S. Children's Bureau. In its weekly news bulletin for March 17, 1928, the bureau gives the following facts:

A study of the vital statistics of the District showed that from 1915 to 1926, inclusive, there has been a very appreciable decrease in the infant mortality rate among both colored and white infants. Tentative figures for 1927, furnished by the Bureau of Vital Statistics of the District Department of Health, appear to indicate the continuance of this decrease, the total infant mortality rate for 1927 being 65.7 deaths per 1,000 live births, the white rate being 47.5 and the colored 107.4. A comparison of the average rate for the three years 1924-1926 in the District, however, with the average rate for the birth-registration area as a whole and with other cities in the area having, like Washington, 2,000 or more colored live births annually, shows that the rate in the District (82.7) during the period was higher than that of the birth registration area (71.9) or of any other city of the group except Baltimore, the difference being due mainly to the comparatively high colored infant death rate in the District.

With regard to maternal mortality, the average rate for the years 1924-1926 was much higher in the District of Columbia (9.6) than in the birth registration area as a whole (6.5) or in any other city of the group mentioned. The average white maternal mortality rate in the District of Columbia was 1.4 points higher and the average colored maternal mortality rate 4.9 points higher than that in Baltimore, which more closely resembles Washington than any other city of the group.

Infectious and Contagious Diseases Reported in Kansas in 1927—During 1927, 41,888 cases of the major acute infectious diseases were reported to the State Board of Health, an increase of 10,972 cases over the number reported for 1926. Twenty-five hundred

and thirty-one deaths were reported, a decrease of 627 in 1926. Fewer deaths from whooping cough, tuberculosis, pneumonia and influenza account for the marked decrease, although there was an increase over the year 1926 in the number of deaths from scarlet fever, diphtheria and infantile paralysis.

Nineteen thousand five hundred and seventy-five cases of measles were reported with 83 deaths, 22,464 cases and 275 deaths were reported in 1917 and 20,263 cases with 129 deaths in 1924. New low death rates were established in three diseases. The death rate from typhoid fever was 3.5 per 100,000 population, only 66 deaths being reported. The previous low rate was 4.0 in 1924. There were 645 deaths from tuberculosis, and the rate was 35.1. There were 931 deaths from pneumonia, the second lowest number on record, and the rate was 50.6. Approximately 800 fewer cases of pneumonia and 138 fewer deaths were reported in 1927, than during 1926. Scarlet fever cases showed an increase of approximately 2,000 over 1926, and more than twice as many deaths. The total number of scarlet fever cases is only exceeded by 1921, when 6,535 cases were reported. Whooping cough showed a decrease of nearly 1,200 cases from the previous year. The disease was less fatal as 1.8 per cent of reported cases died, as compared with 2.6 per cent mortality during 1926.

Thirteen hundred and ninety-three cases of smallpox and one death—that of an infant less than one month of age—were recorded in 1927 as compared with 535 cases and two deaths in 1926. One thousand and seventy-two cases of diphtheria and 75 deaths were reported, as compared with 903 cases and 49 deaths in 1926. Diphtheria was much more virulent in the past year as 6.9 per cent of reported cases died, as compared with 5.4 per cent case fatality in 1926. No deaths occurred during 1926, in children who had been immunized with

toxin-antitoxin. Five hundred and twenty-six deaths were caused by influenza, as compared with 903 the previous year. One hundred and ninety-six cases of infantile paralysis were reported, which ties the previous high number reported in 1910. Forty-nine cases, or 25 per cent, resulted fatally, as compared with 53 deaths, or 27 per cent fatality in 1910. A review of the statistics over a 10-year period shows in children under 5 years of age: whooping cough, 93.6 per cent mortality (55.7 per cent under 1 year), measles, 52.9 per cent mortality, diphtheria 49.6 per cent mortality and scarlet fever, 36.9 per cent mortality.—Kansas State Board of Health. *Morbidity Rep.*, Mar. 10, 1928, pp. 1-2.

1927 A Good Health Year in Illinois—It appears from preliminary statistics that 1927 was one of the healthiest years Illinois has ever enjoyed. A 21 per cent decline in the continued prevalence of typhoid fever, scarlet fever and pneumonia accounted for a substantial decrease below the 1926 mortality from these infections. These data indicate a general mortality rate in the state for 1927 of slightly more than 11 per 1,000 population.

The predominating cause of the favorable mortality rate was the pronounced decline and unusually low prevalence of pneumonia. This highly fatal disorder dropped from 17,629 reported cases in 1926 to 13,202 in 1927, a figure substantially lower than any previous annual record since 1921. Influenza likewise fell off from 4,566 to 1,828 cases. Another particular source of improve-

ment was an apparent drop in the mortality from tuberculosis. Case reports decreased by 2,375. There were only 2,919 deaths from tuberculosis during the first 6 months of 1927 as against 3,013 during the corresponding half of 1926 and 2,986 in the first half of 1925. Scarlet fever prevalence declined from 16,997 cases in 1926 to 14,622 in 1927. This indicates a reduction of 25 or 30 deaths from that cause.

Measles soared to a point higher than in any previous year since 1923, notifications reaching 41,012 cases. This figure probably expresses about one-half of the actual number of cases. Since mortality ordinarily runs to about 1 per cent of the reported cases per year, it appears that the increase in deaths from measles amounted to about 100 in 1927. Diphtheria also ended the downward trend that has marked the course of that disease for several years, increasing from 4,529 cases in 1926 to 6,272. Smallpox incidence rose from 1,098 to 1,247. Fortunately, the disease has been mild so that the relatively large incidence in Illinois did not seriously influence mortality. Perhaps the most disconcerting factor in the year's health conditions was the sharp rise in the prevalence of infantile paralysis. Notifications numbered 483 against 121 for the year before and made 1927 the worst year for that infection since 1921. Reports of venereal diseases brought the annual notifications of those diseases to a new high level in 1927. A total of 35,278 fresh cases were reported, an increase of 6 per cent above the 1926 record.—*Illinois Health News*, 14:35-6 (Feb.), 1928.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C.E.

Estimation of Lighting in Schools—Lighting Birmingham schools was studied by comparing the illumination received on a screen in a given position with the illumination received from the whole hemisphere of the sky. The ratio was obtained by referring each reading to the illumination from a standard lamp. The instrument for this purpose is called a luxometer hand photometer. A coefficient of .01 indicates that the light received at a given point is equal to one-hundredth part of the light available from the total sky.

Readings were made near the middle and at the worst lighted parts of the room. Average readings varied from coefficients .0014 to .02 and "worst" readings from .00043 to .0077. Standards were suggested for good, fair, poor and bad lighting, i.e., good lighting being indicated by coefficients of .02 (or above) to .007 in the middle of the room, and coefficients of .007 (or above) to .003 at the worst lighted points. *Med. Off.*, 37:285 (June 18), 1927. Abstr. C. L. Pool.

Methods for Differentiation of Bacilli of Coli-Aerogenes Group, Applied in Shanghai—The collection made of the coli-aerogenes group included the following strains: 100 from human, 50 from animals, and 50 from soil. The tests applied were: Methyl red, Voges-Proskauer, Koser's citrate, and indol production. Before each test the respective media were incubated for 5 days at 37°C.

Very little difference was noted between the fecal strains from human and animal sources. With the citrate test, 92.7 per cent of the human-animal

strains failed to grow, while only 20 per cent of the soil strains failed. Indol was produced by 91.3 per cent of the strains from fecal sources and by 32 per cent of those from the soil. With the methyl red, Voges-Proskauer tests, 95.3 per cent of the fecal strains and 76 per cent of the soil strains were M.R.+ and V.P.—. From this the author concludes in part that the citrate and indol tests are of value, the citrate being the better of the two, and that the methyl red and Voges-Proskauer tests are of no value.

Inasmuch as the soil samples were collected chiefly from railway embankments, rifle ranges and the tops of grave mounds, it is possible that some fecal strains may have been present in the soil. E. P. Hicks. *J. Hyg.*, 26:357 (Aug.), 1927. Abstr. C. T. Butterfield.

Aeration of Water—An apparatus, consisting principally of 3 aspirator bottles and an aeration chamber made of the outer jacket of a Liebig condenser arranged to determine the amount of oxygen that is dissolved from surface streaming and from air bubbles passing through the liquid in the condenser is described. When water containing about 1.0 p.p.m. of dissolved oxygen was allowed to stand in the condenser with only a small tube open to the air the oxygen content was increased to 1.2 p.p.m. in 24 hours. When the condenser was not quite full, leaving an area of water equal to the cross section of the condenser exposed, the solution of oxygen from the streaming effect was increased to 5.0 p.p.m. after standing an additional 24 hours. However, when air was slowly bubbled through the water in the condenser for only 10 minutes the oxygen content was

increased from 1.0 to 5.0 p.p.m. The authors present this experiment to controvert the opinion that probably only a very minute quantity of oxygen is absorbed by sewage as air passes through it and that most of the aeration takes place at the surface. Gilbert J. Fowler and S. N. Chatterjee. *Surveyor*, 72:139 (Aug. 12), 1927. Abstr. C. C. Ruchhoft.

Holborn and St. Pancras Town Planning Scheme—This article covers some of the recommendations made in a planning scheme for 2 areas having a total of 208 acres. Height of buildings is limited to $1\frac{1}{4}$ times the width of the street, no building to extend beyond a line drawn at an angle of 51° with the horizontal from the opposite side of the street. Buildings used for dwellings shall not cover more than $\frac{2}{3}$ of the plot; where the upper floors of the building are used for residence, the ground floor shall not cover more than $\frac{9}{10}$ and the upper floors $\frac{2}{3}$ of the plot. Business premises shall not cover more than $\frac{9}{16}$.

Nineteen and one-half acres—between 9 and 10 per cent of the areas—are reserved for garden squares. *Surveyor*, 72:358 (Oct. 21), 1927. Abstr. R. E. Tarbett.

Effect of Different Kinds of Pipe On Quality of Water Supplies—Investigations have shown that no matter what kind of pipe is used the water will take into solution a part of the metal, the amount depending somewhat on the water and the quality of pipe.

Iron pipe is affected the most except when galvanized. Tin lined pipes are the least affected. Much zinc is taken into solution from galvanized iron pipe and brass pipe, which also yields a small amount of copper. From copper pipes only a small amount of copper is taken but any zinc present is readily dissolved. Lead pipes have long been known to

yield lead and for this reason are dangerous as 0.04 parts per 100,000 in solution will cause lead poisoning of some people when habitually used. Some doubt exists in the minds of different authorities as to the effect of copper and zinc on the human system.

As a matter of precaution it is suggested that where such dangers as the above exist that the pipes be flushed thoroughly each morning before using the water. A small amount of copper is always present in the human system, coming from water and certain foods. H. W. Clark. *J. New Eng. W. W. Assn.* 41:31 (Mar.), 1927. Abstr. H. D. Cashmore.

Forecasting and Control of Cholera Epidemics in India—This article covers a study of the cholera incidence in the various sections of India and its relation to the climatic conditions, particularly the relation to the rainfall during the previous monsoon and the ensuing winter months. The author found that a deficient rainfall was one of the most important factors in predisposing to cholera epidemics.

Pilgrimages constitute a great factor in the spread of cholera in India, but it was found that this spread was not as great during those years when there was an excess of rain during the previous monsoon as when rainfall was deficient.

By means of the meteorological records, it is possible to be forewarned several months in advance of the danger of an increase in cholera and allow for control measures to be taken particularly with reference to pilgrimages.

The efficacy of anti-cholera inoculation has been demonstrated and the author recommends the inoculation of all pilgrims before starting on their journey to those places where there is more or less danger of contracting cholera. Leonard Rogers. *J. Roy. Army Med. Corps*, 49:261 (Oct.), 1927. Abstr. R. E. Tarbett.

Wet Sludge as Fertilizer—The fertilizer value of wet sludge, 95 per cent moisture, from the Bedford, England, sewage treatment plant is 87 per cent greater than similar sludge air dried, 28 per cent moisture, as determined by actual experiments. The elevation of the sludge outlet valves at the plant are above the surrounding land so that it is possible to discharge the wet sludge on the land by gravity. The advantages claimed by this method of sludge disposal are: (1) Sludge is never so valuable for fertilization as when fresh; (2) it can be more evenly distributed; (3) fresh sludge warms cold soils, makes them more porous, and the fermentations that take place during decay tend to make the soil more mellow; (4) the plant food is more available; (5) when spread evenly and thinly, there is no loss of its valuable constituents through early fermentation; (6) the crop is more even; (7) it improves the mechanical condition and drainage of the soil; (8) it is disposed of with advantage at a low cost. S. Duxbury, *Pub. Works*, 58:374 (Oct.), 1927. Abstr. R. J. Faust.

Operating Results of the Essen Activated Sludge Plant—The activated sludge plant at Essen-Rellinghausen has been in operation since December, 1925, serves 45,000 people, and receives a dry weather flow approximating 130 gallons per capita per day. The wooden paddles (mechanical agitation device) used in conjunction with compressed air have continued to show their usefulness. With a $3\frac{1}{2}$ hour aeration period the air consumption is only 0.08 cu. ft. per gallon, and the entire power consumption is 7 h.p. per m.g.

The analytical results, which are comprehensively stated in a table, show a reduction in suspended solids of from 180 p.p.m. in raw sewage, and 120 p.p.m. in Imhoff tank effluent, to 6 p.p.m. in effluent from the activated

sludge plant. Consumed oxygen is shown as 532 p.p.m. in raw sewage, 350 p.p.m. in Imhoff tank effluent and 30 p.p.m. in effluent from the activated sludge plant. The hydrogen ion concentration remained relatively the same for raw sewage, Imhoff tank effluent and effluent from the activated sludge plant, being expressed as pH 7.5 for both raw sewage and tank effluent and 7.2 for activated sludge plant effluent.

Heating is accomplished by raising the temperature of water from the pressure supply mains, in a boiler heated by sludge gas, to 70 or 80°C., and then introducing it into the bottom of the digestion tank. This obviates the difficulties experienced where heating coils are passed through the sludge. The temperature in the sludge tank, which prior to heating was 8° to 9°C., has since been maintained at 21°C., with a tenfold increase in gas production and consequent increased digestion tank efficiency. Only that gas generated in the digestion tank is used in this way. Gas from the Imhoff tanks is sold to the municipal gas works. Since heating has been introduced the total gas production has been increased, the CO₂ content of the gas has increased somewhat, and the methane content remains over 73 per cent.

The constructions cost, exclusive of preliminary clarification units, is now \$90,000, with an operating cost of \$12,500 per annum. Karl Imhoff. (Trans. from German by Gordon M. Fair). *Eng. News-Rec.* 99:790 (Nov. 17), 1927. Abstr. C. H. Kibbey.

Sink Hole Topography Study for Sewage Disposal—A proposal by the city of Alton, Ill., to dispose of sewage from a rapidly growing sub-division into a sink hole resulted in a study by the Illinois Geological Survey and the Illinois Department of Health. The question raised was whether the sewage thus disposed would enter the Mississippi

River directly above the Alton water works intake. The study disclosed that it would.

Fluorescein was introduced into the stream entering the sink hole and by the following morning green color persisted for two hundred feet in the Mississippi River below the mouth of the subterranean channel.

The article describes in detail the geology of the area. J. E. Lamar. *Eng. News-Rec.* 99:642 (Oct. 20), 1927. Abstr. A. H. Wieters.

Sanitary Problems in a Colliery District—Colliery towns are usually built in narrow ravines where there is barely room for river, railroad and highway. The stream is polluted with coal washings and surface wash from the villages. The water supply frequently obtained from surface sources is often contaminated.

Subsidence due to mining operations damages the houses so that many are made uninhabitable. Pneumonia rate is higher due to returning to homes in damp, perspiration-soaked clothes. Pit head baths should be provided. Smoke abatement measures should be instituted. The sanitary problems in general are peculiar to collieries. W. A. Murphy. *J. State Med.* 35:545 (Sept.), 1927. Abstr. L. M. Fisher.

Investigation of Recirculation and Treatment of Waste Waters from Process of Paper Making—Pollution of streams in New Jersey by paper mill wastes has been a serious problem for the past decade. No type treatment in the state has been entirely successful. Mill owners objected to the recirculation and reuse of water (closed system) for it soured and slime was produced hindering the process of paper making.

The mill investigated and reported on, had 4 paper making machines. All waste white water was being reused.

Two recirculating systems were operated. One used chemical precipitation of wastes and this water was used for felt showers with make-up waste rates of 3 to 1. Other system returned waste white water direct from pits to breakers or beaters. Chemical precipitation plant handles all water over and above that used by breakers or beaters. "Boothall," a balanced coagulant is used. Reclaimed stock from precipitation plant makes up 20 per cent of the material used by No. 1 machine; that is, 15 tons of finished material is procured from 12 tons of old newspaper stock (raw material).

After the investigation was made it was reported that all waste white water was being used and that for long periods it was unnecessary to pollute the creek with this waste. I. R. Riker. *Pub. Health News*, N. J. Dept. of Health, 12:290 (Sept. Oct.), 1927. Abstr. G. H. Hazlehurst.

Treatment of Municipal Offal by Fermentation in Closed Cells—The Becarri system is used in many Italian cities—Florence, Naples, Bologna, Carrara, Nowarra—for treating stable manure. The plant consists of closed chambers of about 5 cubic meters capacity, in which the manure undergoes fermentation for about 60 days. Of the evolved gases, ammonia, being the greatest, is recovered in absorption towers by means of iron sulphate and phosphate of lime. The temperature rises to from 70 to 75°C. by this method of fermentation. Nitrogen losses are also reduced to a minimum. Similar treatment of municipal organic wastes requires only 40 days. A disadvantage of treating this latter material in this way is that approximately 50 per cent of it is not fermentable. Jean Bordan. *Ann. d'hyg. publ. industr. et soc.* 5:142, 1927; Trans. of an abstract by Kaman in *Zentralbl. f. d. ges. Hyg.*, 15:496 (Aug. 10), 1927. Abstr. J. K. Hoskins.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M.D., AND LEONARD GREENBURG, PH.D

Treatment of Burns by Tannic Acid—The author has used the tannic acid treatment of burns, first advocated by Davidson of the Henry Ford Hospital (*Surg. Gynec. and Obstr.*, xii. 202, 1925) in 1925. Aqueous solutions, in a strength of about 2 per cent applied to a burned surface for 24-48 hours produce a coagulum containing degenerated and broken-down tissues. The surface is actually tanned. As the absorption of the toxins is prevented by precipitation, the toxemia does not develop. Thus the constitutional reaction following the burn is modified. (It has been shown that if the blood supplied to the burned area is cut off, the body reaction does not take place. Vogt, by performing parabiosis between 2 animals and burning one, found that both were equally affected, though not so severely as under ordinary circumstances.) The author describes the application of this method to a girl baby aged 2 years, suffering from severe shock and with vesication over the whole scalp, the brow, and down in front of both ears to the neck, the whole of the neck posteriorly, the left shoulder, and the flexor surface of the left elbow joint. A dirty rag dipped in olive oil had served as a dressing and the child was convalescing from an attack of bronchitis. The skin was cleansed with ether soap, loose tissues removed, then swabbed with absolute alcohol. Strips of gauze dipped in a freshly prepared 2 per cent solution of tannic acid were laid over the surface. The whole was then bound loosely in large bandages. A light anaesthetic of ether and oxygen was used for 10 minutes. The dressing was kept moist by sprinkling it frequently with a solution.

A special cage was devised to take the weight of the head and shoulders off of the parts while resting. By the seventh day the coagulum was quite loose on the underlying surface. This was removed on the eighth day exposing a clean healing surface beneath. On the ninth day the child developed bronchial pneumonia but the wound remained clean and the child was up 10 days' later. "There is now a growth of fine fluffy hair over about two-thirds of the surface of the scalp."—R. M. Gordon, *Lancet*, 5451:336 (Feb. 18), 1928. [See also same Journal, page 351, an editorial comment on another case due to a gasoline explosion which emphasizes the immediate relief from pain and lessening of discharge by using 2½ per cent tannic acid.]

The Heating of Buildings—The most popular method in the heating of buildings is that of radiation from coal fires, gas fires, or electric radiators, whose supporters claim that this method is pleasant and exhilarating because the rays do not warm the air through which they pass so much as the objects on which they impinge. The introduction of warm air by the plenum system reverses the process. A new method of radiant heating has been introduced in which large surfaces or panels in the ceiling, walls, or floors, are warmed by concealed coils of hot water pipes, but the radiation so obtained is some 1,400 times less than that from a fire at about 2,000° F. so that "radiant heating" of this type is somewhat misleading. However the Industrial Fatigue Research Board found that in panel heating there was an even distribution of heat over

the room so that temperatures did not vary by more than 2° F. while radiators and plenum systems may vary as much as 10° to 20° between floor and ceiling. Direct panel radiation is said not to have caused any definite subjective effect, such as experienced when gas or coal is used, while rooms heated by fires felt comfortable when 7° cooler than convection-heated rooms, the permissible reduction of air temperature in panel heated rooms was less than 1° . Panel heating, without claiming comparison with the sun's rays, is held to have a great future, and it may come to replace hot water radiators and plenum air installations. "In big rooms, however, any system of radiant heating ought to be supplemented by small hot-water radiators before each large window, so that down-drafts of cold air may be counteracted."—*Lancet*, No. 5454:511 (Mar. 10), 1928.

A Physiological Study of Ventilation and Heating in Certain Factories—Among the practical conclusions deduced in this 82 page report are the following: (1) We are thoroughly in favor of employing natural systems of ventilation as against artificial ones, but we realize that it may frequently be impossible to avoid artificial aids entirely; (2) local exhaust ventilation for the removal of dust and fumes may be essential; (3) cross window ventilation is often insufficient especially in winter time when most of the windows are kept shut, so some form of exhaust is necessary, and may require mechanical assistance; (4) the extraction of the air should never, under ordinary circumstances, be at floor level, since this increases the amount of air movement around the feet; (5) such exhausts should be located about 7 or 8 feet above the floor instead of 10 feet so as to increase the air movement about the head level; (6) certain shapes of factory

rooms such as large square rooms require special solution; (7) too much stress cannot be made on the principle of placing the source of heat as near the floor as possible; (8) the hot air or radiators should be kept at a relatively low temperature, for the hotter the air the more quickly will it rise to the roof—overhead steam pipes are the worst offenders but overhead plenum installations are likewise bad since they may induce temperature differences amounting to 11° - 21° between the floor and ceiling level; (9) the amount of energy wasted by overheating the upper strata of air in factories must be enormous; (10) heating units installed near the floor caused very low temperature gradients, while those under the floor gave an even temperature at all levels. "Therefore we think it very desirable that heating engineers should attempt the introduction of floor heating systems wherever they consider them practicable," and (11) natural ventilation is not only less expensive than artificial systems, but more pleasant, more healthful and creates a greater sensation of freshness. "There is some *prima facie* evidence that the health of the workers is influenced by moderate differences in the atmospheric conditions under which they are working. At one factory, the time lost from sickness was determined for 809 women over a period of 2 years, and in a workroom where the mean temperature was 7° F. above the average for the whole factory (owing to the presence of drying stoves) the sickness was 32 per cent in excess, while in another room where (in winter) it was 7° below the average, it was 21 per cent in excess. At another factory, 2 groups of women were engaged on the same occupation in different rooms, in one of which the mean air velocity was only half as great as in the other. The women in this room were found, over a 2-year period, to have 53 per cent more sick-

ness than the others.”—H. M. Vernon, T. Bedford, and C. G. Warner, Industrial Fatigue Research Board, Great Britain, London W.C.2. *Report No. 35*, 1926.

Carbon Monoxide Poisoning—The first of these bulletins evidently printed by the Carnegie Steel Company was issued in October, 1922, and reviews the specific literature and findings on carbon monoxide poisoning with the addition of the author's own observations. In regard to treatment the author prefers the mechanical method, using the pulmotor. “In over 100 very severe cases, this apparatus was used and excellent results obtained, with no noticeable after effects. It furnishes a mixture containing over 37 per cent oxygen, and owing to its mechanism supplies the lungs with a greater volume of this mixture than is possible by any of the manual means, thus ventilating the lungs regardless of the lessened amount of CO_2 in the blood, and also regardless of whether the patient is breathing or not. The pressure feature is a good one, and I believe, due to this pressure, the blood plasma will take up Oxygen and carry it to the tissues independently of the corpuscles.” . . . “It is essential that the pulmotor or the manual method be continued for at least 2 hours before hope of resuscitating the patient is given up.” The author has never seen any serious after effects of gas poisoning, although some of his patients were unconscious for several hours and 1 case for 3 days. “Several patients complained of muscular pains and headache lasting a few days; 2 patients were partially demented for several days, and another for 2 weeks, but in all these cases they made an uneventful recovery.”

The second bulletin dated, January, 1928, of 39 pages, also entitled “Carbon Monoxide Poisoning,” appears to include the material of the first bulletin

with the addition of much new material largely from the literature, but in the last few pages summarizing his own experiences. He again states that after 18 years' experience in the treatment of several hundred cases of gas poisoning using the pulmotor he has found the criticisms of it unfounded, while in such cases as those having broken ribs, burns, lacerations, etc., the Shafer Prone Pressure Method would cause further damage. The author believes that exposure to low concentrations over long periods of time results in mental sluggishness with deficiency of muscular power and such symptoms as indigestion, loss of memory, loss of sexual desire, headaches, tired out feeling, loss of appetite, and nausea. Yet, the author has talked with a number of men who have been exposed daily for years, and who exhibited no symptoms whatever. He has never seen anemia, nor optic disturbances in chronic poisoning. He considers that the blood will have to be saturated from 50 to 55 per cent before there will be a deficient oxygen supply to the tissues. In over 2,000 cases, in all degrees of severity, he has seen but few serious after effects and knows of only 1 case in which the patient has been demented for several years following severe gassing. He has never seen a single case of pneumonia develop following carbon monoxide poisoning and suggests that when the same occurs it is not due to carbon monoxide but to the fact that the patient is unconscious so that saliva and foreign material gets into the respiratory tract causing an irritation. Thus it is impossible for pneumonia to develop in mild cases where the patient is not unconscious. Deferred fatal results may occur in heart disease victims. Such result may take place from 3 hours to 3 or 4 days following the gassing, “but during this time the patient is markedly short of breath and fighting for air continuously, especially on the least physical effort.

I do not believe it possible for a patient to be gassed and completely recover and then develop some condition months afterwards. If any damage has been done, sufficient to cause any symptoms, these symptoms will persist until nature has cured them and after that there will be no re-occurrence."

(The *abstractor* considers the author's vast experience of great importance but regrets that the author has never published the details of his cases so that others might study them.)—Frank S. Rossiter. Carnegie Steel Company, Pittsburgh, Pa., Jan. 1928.

Visualization of Industrial Hygiene By Models—In an attempt to combat the carbon monoxide hazard in public garages the bureau of industrial hygiene illustrates a garage equipped with suction fans, beneath gratings in the floor where automobiles stand, which will change the air completely in from 3 to 5 minutes. Intakes are also provided to equalize the out-take. (Illustration accompanies article.) This arrangement

dilutes the CO content so as to make the hazard negligible.—*Ind. Hyg. Bull.*, N. Y. State Labor Dept., Dec., 1927.

Phosphorus Poisoning and Compensation—Compensation for phosphorus poisoning contracted during the course of employment has been denied under the Virginia law in *Turner v. Virginia Fireworks Co.*, 141 S. E. 142. In this case it was agreed that the employee had to handle white phosphorus and that in rubbing an aching tooth, she conveyed the poison to her mouth. This circumstance, was however, held not to have been an accident within the meaning of the workmen's compensation act of the state. This is a peculiar decision, to say the least, especially since a Maryland decision of 1925, *Victory Sparkler and Specialty Co. v. Francks*, 128 Atl. 635, held exactly the opposite.

A comprehensive article entitled "Workmen's Compensation and the Conflict of Laws," by Ralph H. Dwan appears in the *Monthly Labor Review* of the U. S. Dept. of Labor, Mar., 1928.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Growth on a Synthetic Ration Containing Small Amounts of Sodium—Previous investigations having shown that certain amounts of sodium or potassium or both are essential in the diet, an investigation was conducted to find the amount of sodium required in a synthetic ration. The diet mixture contained casein, yeast, agar, lard, cod liver oil (rich in vitamin A), starch and salt mixture, sodium carbonate being eliminated from the ration. The carbonates of calcium, magnesium and potassium, as well as citric acid were

added in powder form. To this basic ration varying amounts of sodium bicarbonate were added. Rats fed on rations containing sodium varying from 0.02 to 0.5 per cent failed to maintain successful growth when the sodium was 0.30 per cent or less. Differences in growth periods are shown for animals on a ration containing 0.2 and 0.3 per cent sodium, and the physical condition of the animals also is marked in the growth curves. The animals receiving smaller amounts of sodium were seriously affected. There was no reproduction on

any of the vitamins used. Vitamins A, B, and D were adequate so that poor growth is not attributed to vitamin deficiency. Immediate improvement resulted when the stock rations were restored.—J. L. St. John, *J. Biol. Chem.* 77:27 (Apr.), 1928.

The Vitamin Content of Mung Bean Sprouts—Mung bean sprouts constitute a considerable portion of the diet in the oriental population of Honolulu, these sprouts selling for 5 cents a pound. They are produced from green mung beans, the nutritive value of which has been studied and reported (*A. J. P. H.* Jan., 1928, p. 114), and are shipped directly from China. Great care is taken in the sprouting of these beans to produce a clean white product with very little chlorophyll formation. A résumé is given of work previously done on the vitamin content of bean sprouts as regards A, B, and C, and tables are included showing the composition of the mung beans and fresh sprouts. In the investigation reported the bean sprouts were cooked by steaming for varying periods from 2 to 8 minutes. In determining vitamin A, basal diet of meat residue, starch, yeast, salt mixture, sodium chloride and Crisco were used and the meat residue was treated for extraction of casein and the whole mixture exposed to bright sunlight to insure the presence of vitamin D. Both raw and cooked bean sprouts were fed. Four gm. of raw and 4 gm. of cooked sprouts produced gains approximating 3 gm. Bean sprouts are a fair source of vitamin A compared to some other vegetables; according to Sherman's evaluation they have 110 to 120 units per lb. as against 750 to 3000 units per lb. for lettuce and 2500 to 3500 units for green peas. In determining vitamin B it was found that in rats weighing 46 to 59 gm. and 28 or 29 days old, 3 gm. of raw sprouts produced perfect results. Animals were found to be the same weight at the end

of 8 weeks as at the beginning of the experiments. It was concluded that the amount of raw sprouts in the daily ration supplying vitamin B and maintaining weight is between 2.5 and 3 gm., and 2.2 and 2.7 for the cooked. The latter weights are equivalent to those given for the raw, there being little loss of vitamin B in cooking. Compared with other vegetables on Sherman's basis, bean sprouts show 150 to 180 units per lb. as against 150 to 200 for lettuce, 120 to 140 for carrots and 1000 for raw peas. Guinea pigs were used to determine the vitamin C content, being placed on Sherman's vitamin-C-free diet plus fresh alfalfa. Two gm. of raw sprouts were found to be insufficient to prevent scurvy. Of 4 guinea pigs fed 2.7 gm. cooked bean sprouts (equivalent to 3 gm. raw) two showed no sign of scurvy and two slight scurvy. It is concluded that the protective dose of bean sprouts so far as vitamin C is concerned lies between 3 and 4 gm., there being considerable destruction of vitamin C even in 5 minutes steaming. On Sherman's comparative basis, lemon juice, orange juice and tomatoes will equal 150 to 300 units per lb. Cooked bean sprouts have approximately 150 units per lb., or a trifle less.—Carey D. Miller and Doris B. Hair, *J. Home Econ.*, 20:263 (Apr.), 1928.

Chemical Sterilization of Milk Bottles in Relation to Tubercle Bacilli—The work recorded here was undertaken for the purpose of determining the efficiency of certain chemicals in sterilizing milk bottles infected with tubercle bacilli. Bottled milk is served to inmates of state institutions of Minnesota, many of whom are tuberculous and who drink the milk directly from the bottles by means of straws, providing a possible avenue of introduction of tubercle bacilli into the bottles before return to the dairy. Three series of experiments were conducted. In the

first experiment, milk was infected with sputum containing active tubercle bacilli, and to some of the milk was added calcium hypochlorite solution containing 10 p.p.m. available chlorine. One-half c.c. of this was placed at the bottom of clean milk bottles. Three concentrates of calcium hypochlorite solution was used, 10, 20 and 30 p.p.m. available chlorine. The contents were thoroughly agitated and centrifugalized, and two guinea pigs were inoculated from samples of each lot. One pig from each lot was chloroformed and autopsied 17 days after inoculation and its mate 23 days after inoculation. Every pig showed extensive tubercular lesions with abscesses at inoculation sites. The second series was made using chloramine (prepared by the action of ammonium chloride on calcium hypochlorite in solution) in dilutions of approximately 10, 30 and 100 p.p.m. available chlorine. The chlorine content was determined by titration. Control tests, using two pigs for each, were made with sputum treated with each dilution of the neutralized chloramine solution. All control pigs showed lesions of tuberculosis when autopsied 30 days after inoculation. These pigs showed abscesses at inoculation sites. The remaining pigs were autopsied 50 days after inoculation and showed all organs normal with increase in weight. These tests indicated that the lowest strength of chloramine effective is 95 p.p.m. for a period of 3 minutes. In the third experiment $\frac{1}{2}$ pint bottles instead of pint bottles were employed. The disinfecting solution entirely filled the bottle. These tests were for the purpose of comparing calcium hypochlorite in dilutions of approximately 50 p.p.m. available chlorine for 1 to 3 minutes, and both calcium hypochlorite and chloramine in dilutions of from 100 to 500 p.p.m. for periods of $\frac{1}{2}$ to 3 minutes. The chlorine solution deteriorated rapidly. The actual chloramine strengths determined by re-titration are indicated in tables. The control

pig showed lesions of tuberculosis when autopsied 31 days following inoculation. The remaining pigs were chloroformed and autopsied at the end of 2 months and showed no tuberculosis and had increased in weight. This test checks closely with series II, indicating that a strength of chloramine of approximately 100 p.p.m. available chlorine for 3 minutes is effective in killing tubercle bacilli and that in all of the experiments calcium hypochlorite was unsuccessful in destroying these organisms.—E. M. Wade, R. W. Archibald and H. A. Whitaker, *J. Bact.*, 15:189 (Mar.), 1928.

The Manganese Content of Raw and Cooked Vegetables—Similar work has been previously reported (*A. J. P. H.* Dec., 1927, p. 1288) on the manganese content of different plants and vegetables and the experiments herein reported were to determine the effect of cooking on the manganese content. Ten vegetables were analyzed to determine their manganese content. Both cooked and uncooked spinach, string beans, and beets are high in manganese while rutabaga, cabbage and onions have small amounts. The stalks and leaves were found to have a higher content than the roots, tubers and bulbs. Tables are given showing the loss of manganese in cooking and the manganese content of uncooked and cooked vegetables. Losses were found to be slightly greater for leaves than for roots, tubers and bulbs. An average loss of 20 per cent was noted when vegetables were boiled in a moderate amount of water, while there was a loss of 40 per cent when boiled in excess water. A loss of 12 per cent was noted in steamed vegetables and in pressure cooked vegetables, 22 per cent. Hence, steaming was found to be the most effective method for conserving the manganese content of vegetables while boiling in excess water the least efficient.—Stella Munger and W. H. Peterson, *J. Home Econ.*, 20:194 (Mar.), 1928.

CHILD HYGIENE

MERRILL E. CHAMPION, M. D.

Health Teaching—The teaching of health in the school system is now quite generally accepted after years of discussion pro and con. Health teaching in the hospitals is at present in the growing stage, being accepted by some and rejected by others. Miss Murphy, who apparently feels that education should reach all groups, outlines the various possibilities of public health instruction as afforded by groups in a children's hospital.

First, there is the child who is hospitalized for an indefinite period of time, a chronic or semi-chronic illness. The institution, with its provision of proper food for the patient, can in addition directly or indirectly influence that child's attitude toward various foods and health. Sickness results often in an over-indulged child with a finicky appetite. This problem may be overcome by hospital teaching.

The outpatient clinic presents another opportunity for constructive work. Waiting is inevitable but may be made more interesting by posters, books, toys, pictures, motion pictures, etc., of which health might be the basic principle.

A clinic offers the possibility of special health instruction to selected groups referred by the physicians for the nutrition or health class. Parental education especially is needed in conjunction with such a group. A child brought to a clinic is often suffering not only from a specific ailment but also from a faulty home routine of food, rest, exercise, etc. Upon the release of the child the responsibility rests completely upon the home and its environment which can be affected only by adult education. Health supervision of the family as a unit, with

the examination of all the children regardless of their condition, has been found of influence by various health organizations. The personnel includes the examining physician who is the foremost teacher, with an assisting worker who is responsible for sound health information and for the motivation of the family group. Home visits by this worker or a social worker are an essential part of the program.

If one accepts the premise that a hospital should sponsor a preventive as well as remedial program, then health education for all groups should be part of the hospital plan.—Mary E. Murphy, *Health Teaching in a Children's Hospital. Arch. Pediat.* 45, 4: 219 (Apr.), 1928.

Changing Points of View in Mental Hygiene—When we are inclined to feel pessimistic about mental attitudes in the present day, it proves encouraging to glance at the progress already made in our appreciation of the real meaning of mental disease and the promotion of mental health. In this article by Elkind we are carried from the period when people thought that the insane were possessed of evil spirits and when it was thought that the proper handling of such a possession was punishment, torture or execution, down to the present comparatively rational idea of mental disease and mental hygiene.

Apparently it was not until the last years of the 18th century that there began to be an appreciation of the fact that the insane were in need of humane medical treatment. At this time asylums were erected for the treatment of the insane who, however, were still consid-

ered to be suffering from a largely incurable disease and one which carried a stigma to the family of the unfortunate sufferer.

It remained for the 20th century, however, to bring into the foreground not only humane medical treatment but rational attempts at the prevention of mental disease and the promotion of mental health.

The conclusion which the author draws is that hygienists now need to do more than advise parents with regard to proper physical health habits. They should also be taught that the proper use of their mental powers is necessary to a working adjustment to life. We must show parents the need of preventing their children from being born with defective mental endowment. The community must be made to feel that "any adequate mental hygiene program must come in contact with or overlap practically all of the various activities of social or community work being done at the present time," and that child hygiene is ineffective unless it means the hygiene of the whole child both mental and physical.—Henry B. Elkind, M.D., Dr. P. H., *The History of Mental Hygiene*, *J. Outdoor Life*, 25, 4 (Apr.), 1928.

Drop in Infant Mortality—

The lowest infant mortality rate ever recorded for Prussia is that for 1926. The figure given, namely, 101 per 1,000 live births, is perhaps high according to certain standards, but is the result of a steady decrease over a number of years in Prussia. Local authorities apparently attribute this decrease mainly to a more general spread of information among the public concerning infant hygiene and the encouragement of welfare work. Breast feeding is being stressed by the Prussian Government through the payment of nursing benefits. Health centers are carried on and their records show a decrease in the amount of mal-

nutrition and a decrease in the incidence of rickets. In 1925, according to the report, 20 per cent of the children examined in 58 cities and rural districts of Prussia had rickets, whereas, in 1926, the percentage was only 10.—Infant Mortality and Child Hygiene, News Note from *Child Welfare News Summary*, Children's Bureau, March 31, 1928, quoting *Volkswohlfahrts*, Berlin, Feb. 1, 1928.

Fetal Morbidity—With the increasing realization that the future improvement of infant mortality must come within the early age group, any study of antenatal factors is most timely. The authors of the article here abstracted refer to the usual causes of early infant death such as syphilis, toxemia, disease or malpresentation of the placenta, particularly placenta praevia, operative delivery because of contracted pelvis, excessive size of child, and malpresentation or prolonged delivery from any cause. They also refer in passing to the fact that in the literature may be found reports of a relatively small group of infections such as typhoid fever, scarlet fever, and other acute communicable diseases. Their own contribution consists of two carefully studied cases, one of which was infection with pneumococcus superimposed on syphilis, and the other pneumococcus recovered from the blood of both the fetus and mother indicating to them definitely a maternal transmission.

A review of the literature is given and the following summary indicates the conclusions they draw.

Maternal infections bear an important influence on fetal viability and mortality. The transmission of a general infection takes place through the maternal blood vessels to the circulation of the fetus through apparently unruptured vascular channels. Practically all known specific diseases have been encountered. . . . A review of the literature and our own cases bring to the forefront the importance of the maternal prenatal care. Even such momentarily insignificant minor disabilities as sore

throats and coids should receive the most careful attention.—

Emile Duskes, M.D., and Eva F. Dodge, M.D., Antenatal Infection a Factor in Fetal Morbidity, *Am. J. Dis. Child.*, 35, 2 (Feb.), 1928.

Breast Feeding in Denmark—The little country of Denmark, noted for its advanced ideas in many directions, is reported as showing a steadily increasing recognition of the desirability of promoting the welfare of the child by keeping the mother and child together and seeing to it that living conditions are such that the mother is enabled to nurse her child. They use three methods to accomplish this purpose: One is homes for mothers and babies; another is crèches; and the third is breast feeding stations.

Denmark now has 13 homes providing accommodation for 187 nursing mothers and 375 children. Many towns have well organized crèches which are under official regulation. Infant welfare stations for the promotion of breast feeding are found only in Copenhagen, where, since 1908, there have been 8 such stations in the poorer parts of the city and admitting only breast-fed or partially breast-fed babies, but drawing no distinction between married and unmarried mothers. The mothers visit the station every week or two for examination of the babies and for health instruction. Needy mothers receive a quart of milk a day for their own use and if necessary, free dinners and clothing for the baby. A home visiting

nurse system is also in operation. The statement is made that the stations have cared for nearly 10,000 children since 1908 and of these only 2 per cent died, while under care.—Promotion of Breast Feeding, *National Health*, London, Mar., 1928. (Quoted by *Child Welfare News Summary*, Apr., 1928.)

The Work so far Accomplished in New York City with the use of the Calmette Vaccine Against Tuberculosis—Dr. Park of the New York City Health Department, has been doing some work with the Calmette vaccine in the immunization of infants against tuberculosis. It was given only to babies from tuberculous families and was checked by a control series receiving no treatment. Fifty infants are now under observation who have received the treatment and about twice as many who have not received it. No harmful effects whatever have been noticed in the babies receiving the treatment and none has died of tuberculosis. In the control cases about 7 per cent have died of tuberculosis.

As a result of this work Park goes on record as stating that the vaccine seems to be harmless. He does not fear that the attenuated living bacilli might later become more virulent with resultant damage in later years. He feels justified in carrying out a thorough test especially in view of the apparently successful results obtained in France.—William H. Park, M. D. *Child Health Bull.*, IV, 2 (Mar.), 1928.

PUBLIC HEALTH NURSING

MIRIAM AMES, R. N.

Liver Diet—Pernicious anemia is a disease in which, for some unaccountable reason, the red blood cells are destroyed. If this destruction persists and the cells are not regenerated, the outcome is fatal to the patient. For a long time this disease was regarded as practically incurable. Now, however, through the work of various doctors, among whom are Dr. George R. Minot and Dr. William P. Murphy of the Peter Bent Brigham Hospital of Boston, a diet has been discovered which will bring about the regeneration of blood cells. This diet, found to be effective when faithfully continued, consists of the following foods:

Either calves or beef liver given every day in rather large amounts. This should never be fried or prepared with fat.

Fruit containing a low percentage of sugar given twice each day in place of sweet desserts.

Green vegetables make up a large part of the diet. Certain vegetables, such as corn, parsnips, beans, either baked or shelled, should be avoided.

Fairly large amounts of muscle meat, such as roast, steak, hamburger steak, and lamb chops or roast should be taken in addition to the liver. This also should not be fried or prepared with fat.

Dry bread, preferably of the coarser kinds of flour, but not soggy or hot breads, is permitted. Cereals may be taken at breakfast and food, such as potato, rice and macaroni is allowed once daily.

One egg and a glass of milk may also be taken each day.

Fried and fatty foods, except small amounts of butter and cream, and all very sweet foods, except two or three teaspoonfuls of sugar each day, should be avoided.

This article includes a number of ways of preparing liver to make it palatable.—The Minot and Murphy Treatment of Anemia. *Pub. Health Nurse*, 19, 6:278 (June), 1927.

Nursing Education and the Universities in Great Britain—"Great Britain, the cradle of modern nursing, was the second country in the world to establish courses for nurses in connection with universities, the United States having been the first in the field by the greater part of two decades.

"A beginning was made in 1918, when a course for sister tutors—that latest creation in the nursing world and perhaps the most indispensable in the progress of our profession in its many branches—was introduced into the program of King's College for Women, affiliated with the University of London. The satisfactory taking of this 1-year course entitles the student to a College Certificate. The course was established at the request of the association of nurses known as the College of Nursing, Ltd.

"In 1921, the University of Leeds, one of the youngest universities of England, having been incorporated in 1904, established a 'Diploma in Nursing,' to be conferred upon state registered nurses possessing certain qualifications who have followed a prescribed 3 months' course and successfully passed an examination, the latter laying much stress upon practical nursing.

"In 1927, the University of London established a 'Diploma in Nursing,' to be conferred on state registered nurses who successfully pass a prescribed examination. This is, as far as we know, the first examination for trained nurses conducted by a university which is not necessarily preceded by a particular course of some kind.

"The University of London not only examines and confers degrees upon 'in-

ternal students' who have pursued their studies in one of the schools of the university, but also examines and grants degrees to 'external students,' from whom no definite course of study or residence in the university is required; finally the third department is that of the University Extension. Under the present arrangement nurses come under the last and receive their diplomas as a result of an examination without having taken a definite course beforehand.

It is only to be expected that the developments in nursing education in the colleges and universities of Great Britain will be, at least for some time to come, somewhat different from those of other countries, because of the strong traditions of independence and self-government in the higher educational institutions in that land. The English universities, on the other hand, are very similar to those of America and Canada in their admission requirements, the first two or three years of the university curriculum being equivalent to the last two or three years of secondary school in some European countries."—*The I. C. N.* 3, 1:11 (Jan.), 1928.

NOTE: The programs of these university affiliations are described in detail in articles to be found in *The I. C. N.* under the titles, "The Sister Tutor's Course, Kings' College, University of London," by G. V. Hillyers; "Diploma in Nursing, Leeds University," by E. S. Innes; "Diploma in Nursing, University of London," by G. M. Bowes; "Training of Health Visitors in Scotland, University of Edinburgh," by Nora Milnes; and "International Courses at Bedford College, University of London," by Maynard L. Carter.

The Nurses' Official Registry of Buffalo—How one city is meeting the nursing needs of a community to the satisfaction of the public, the nurses and the physicians, is told in the April issue of *The American Journal of Nursing*, by Dr. Thew Wright.

The only professional registry in Buffalo in 1925 was conducted by the

Nurses' Alumnae Association of the Buffalo General Hospital, and during that year a survey was made of nursing conditions in the city. The facts revealed that nursing care was inadequately provided, and that there was much discontent on the part of the professional groups as well as the public. A closer understanding between those three groups was highly desirable. The recommendations of the report of the committee of the New York State Nurses' Association, which made a survey of nursing conditions throughout the state, seemed to offer the solution to the problem of what to do in Buffalo.

The Nurses' Official Registry of Buffalo is now a flourishing concern, having been formed by combining the existing nurses' registries under one head. All applicants are required to be registered according to whether or not they are licensed, trained nurses (State Hospital), trained attendants or practical nurses. All the groups are controlled by rules and regulations applicable to their own amount of experience.

A wise provision is made for a governing board. This governing board has complete control of the registry and consists of representatives from the various nurses' alumnae associations, the medical profession and the laity in the following ratio:

1. One-half the board consists of nurses and includes one representative from each coöperating alumnae association, the chairman of the local League of Nursing Education and one representative for the district branch of the State Nurses' Association.

2. One-quarter from the medical profession, two of whom are appointed by the County Medical Society, the remainder being elected by the board.

3. One-quarter from the laity, selected by ballot of the board.

Much has been done to bring about a good organization and to interpret to the public, in terms of service, the aims and functions of the registry, so that all may know and take advantage of it.

Under the managing board, the director, a graduate, registered nurse, and two assistants (graduate, registered nurses), manage the actual working of the registry. Regular reports are rendered by the director at the board meetings. A committee of censors receives and reports to the board for action all complaints received from anyone.

The Visiting Nurse Association works in close coöperation with the registry. Through it are handled all calls for nurses which come in after regular office hours, the hourly nursing service, and the special night maternity service.

The results so far are:

1. Better understanding is shown between nurses, doctors and patients, due to their combined interest and the splendid coöperation shown between these groups.

2. The nursing situation is in a better state today than before the Nurses' Official Registry was established. The nurses know their interests are being cared for and that they have the backing of an authoritative body when they need it.

3. The medical profession is better satisfied because its wants are far better met.

4. The public finds that its needs are more adequately filled.

Unqualified endorsement by the County Medical Society and the favorable comment heard by individual doctors seem to indicate that the venture is a success. Provision is made for all classes of cases by supplying the various kinds of nurses needed. Surely no one in Buffalo needs to say that nursing care is not available.—Thew Wright, M.D., The Nurses' Official Registry of Buffalo, *Am. J. Nurs.*, XXVIII, 4:321 (Apr.), 1928.

Mutual Interdependence is the Keynote—The seven training courses for Red Cross Chapter workers in the Eastern Area came to a close at National Headquarters in Washington, April 4. The workers attended in the capacity of "students," while the staff members composed the "faculty." Hundreds of students took this opportunity of broad-

ening their own scope and crystallizing their ideas with regard to the work of the Red Cross. There can be no question but that much help was given on both sides in the solution of specific problems that concerned the workers and their chapters.

The courses met with enthusiastic response which argues well for the desirability of having similar courses next year.—*Red Cross Courier*, 7, 8:3 (Apr.), 1928.

NOTE: It seems worth while to mention briefly the main objective now being emphasized as a guide for future development, which is that the Red Cross Nursing Service shall assume a position of permanent responsibility and leadership in public health nursing in the community. Chapter workers are being encouraged to retain their share in the partnership with public authorities in the direction of joint services; to develop new nursing projects where their first ones have been taken over completely by the official health agency; and to render active assistance in the effort to secure uniformity of standards in the service within their county.

Public Need and Professional Response—Many people who should have nursing care do not have it because the nurse's fee seems exorbitant. To them, the services of a nurse seem available only to the very rich who can well pay for them, or to the very poor who can pay nothing. On the other hand, there are many well trained nurses who spend four months out of every year waiting to be called upon.

In many places, the situation is being met by a nursing service on an hourly basis, whereby the patient buys an hour's nursing care, or more, whenever he may need it. This service may be obtained in different ways. In some cities, it may be given by individual nurses, "free lances." In others, it may be procured through nursing registers or through visiting nurse associations.

If hourly nursing is to be a success, there must be developed in each sick member of the community an awareness of nursing practice as it relates to the

needs of the other ill members of the community. On the other hand, private duty nursing service must be organized to meet such needs in the community.

Both the patient and the nurse will benefit by such a service. The patient receives adequate nursing care by one qualified to give it at a price within his means. The nurse has regular employment and time for recreation and growth.—Virginia McCormack, Nursing Mr. Middle-Man, *Survey*, 60, 2:107 (Apr. 15), 1928. B. J. B.

The Picture of the Optimal Child
—These days, so much is heard regarding physical defects and their corrections that we are apt to forget to question the goal toward which we are striving—the perfectly healthy child. What is this perfectly healthy child? How shall we recognize him when we have found him?

Dr. Hugh Chaplin in his booklet *Signs of Health in Childhood*, published by the American Child Health Association, portrays this youngster for us and goes further to tell us what factors combine to build an "optimal" child. The following summary of his pamphlet is taken from the *Boston Evening Transcript* of May 1.

The factors which combine to build an optimal child are: regular meals; sufficient food of the right kind but no overfeeding; plenty of fresh air and sunlight; plenty of sleep with windows open; freedom from unnecessary noise and excitement; baths at least three times a week; brushing teeth twice a day; correction of defects as they occur, for the

detection of which physical examinations are necessary at regular intervals; happy associations and interesting things to do; pure cod liver oil daily during the first two years except during the heat of summer.

The outward manifestations of a well-functioning body are: an alert, happy expression; a moist, red and clean tongue; sweet breath; good posture; prompt, efficient muscular co-ordination; bodily repose as shown by freedom from constant and unnecessary activity; ability to indulge in all ordinary exercises without undue fatigue.

A well-built body reveals itself in plentiful hair, with luster due to sufficient natural oil; bright, clear eyes, moving normally, no squinting nor dark fatigue rings, and mucous membranes pink and free from inflammation; the ability to breathe deeply and easily through the nose with mouth closed, especially when exercising and sleeping; teeth well-formed, well-enameled, clean and free from cavities and set far enough apart to be quite even in jaws, wide enough to provide sufficient space; skin slightly moist, clear, soft and smooth; firm, strong muscles; shoulders not rounded forward; broad, deep chest, with good expansion; long bones of arms and legs straight, joints not enlarged, legs neither bowed outward nor inclined inward; inner and outer sides of ankle equally prominent; arches of feet strong and limber and inner borders of feet straight from heel to tip of great toe.

Optimal children may differ because of the effect of age upon body proportions and upon muscular development, muscular co-ordination and posture and because of variations in rate of growth and types of body build. They will, however, be alike in health and a keen enjoyment of life and bodily efficiency. It is only necessary for parents and children to learn how to live wisely in order that children may become and remain physically and mentally fit.

B. J. B.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

Twenty - Seven Opportunities— From time to time this department has described various opportunities for special distribution and uses of publicity and educational material of particular interest and value. While this issue of the JOURNAL is being printed the list below has been submitted to workers in the whole field of social welfare at Memphis in connection with the annual meeting of the Committee on Publicity Methods. It is given here to secure criticisms and amplifications with a view to preparing a check list which may be of permanent value to health agencies. The list is provided that every health worker will correct and amplify it to suit his particular field and for his city and state. Have a supply of the corrected list mimeographed, and issue standing orders that 1 copy of the check list together with 12 copies (or other specified minimum number) of every piece of printed or other material be delivered to your desk. You can check the list for special distribution, and specify the special forms of delivery, if any, such as a committee to visit the governor or mayor, personal card, notation, covering letter, etc. Here is the list:

Local: 1—Mayor; 2—Members City Council; 3—Members County Board; 4—Key men and women (start a list); 5—Public Library; 6—Public School Library; 7—College library; 8—Other Libraries.

State: 9—Governor; 10—State Library; 11—State Library Commission; 12—State University; 13—State Extension Department; 14—State Municipal or Legislative Library; 15—Your state association.

National: 16—Your national association;

17—News Bulletin, Committee on Publicity Methods, 130 East 22d St., New York, N. Y. (All samples of good, or especially bad, publicity materials, ideas or technic); 18—*The Survey*; 19—*Better Times*; 20—*American Journal of Public Health*; 21—Education and Publicity Department of A. J. P. H. (Address: Evart G. Routzahn, 130 East 22d St., New York, N. Y.); 22—Library, Russell Sage Foundation (When in New York call and get acquainted); 23—Frederic J. Haskin News Service, Washington (for material possible for a good writer to put into feature article form for national newspaper distribution); 24—Public Affairs Information Service, 11 West 40th St., New York, N. Y. (for all publications of interest to any type of library); 25—Science Service, Washington, D. C. (Send page proofs, etc., of research reports, etc.); 26—*Cumulative Book Index*, 958 University Ave., New York, N. Y. (for all bound books); 27—Library of Congress.

Types of Publicity and Cooperation—Here is a compactly summarized report of the types of publicity used and some of the forms of coöperation given in the recent Early Diagnosis Campaign of the tuberculosis associations. The summary makes an excellent check list of both accepted methods and novel ideas for a health education campaign, as compiled by Dr. H. E. Kleinschmidt of the National Tuberculosis Association.

Special Clinics: Special clinics at County Fair—Florida; Special clinics at night—South Carolina, Los Angeles, Pennsylvania; High school clinics—South Carolina; County health officer plans to give complete physical examination to every high school child during March—West Virginia; Mayor of Boston given chest examination by Dr. Hawes; Demonstration chest clinics with medical societies—Missouri; Special clinic publicity—Maryland; Stage actual chest examination in store window in business section—Minneapolis, Minn.

Coöperation by Sanatoria: Superintendent of sanatorium framed posters to keep them permanently—New Jersey; Offer literature for

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

patients in sanatoria and for them to send to friends—Pennsylvania; Send letters to contacts (names obtained from cases in sanatoria) urging examinations—Wisconsin; Special letter to ex-patients of sanatorium asking their return for examination—Camden, N. J.; Superintendent State Colored Sanatorium sent personal letter to all negro physicians and dentists about Charleston asking coöperation and telling of clinic scheduled by him.

Boy Scouts Coöperate: Boy Scouts distribute pamphlets in theatres with showing of film—Morristown, N. J.; Boy Scouts place posters in schools, buses, pool rooms, and trolleys—Oil City, Pa.

Radio Coöperation Radio Stations—WLAC, WSM, WEA (Bagley), WHO, WEEL, KWK (Weekly talk), KNOX, WCAU, WMC; State Commission of Health broadcast E. D. C. talk (Massachusetts and Tennessee), seven stations in Chicago, Ill., and others not named, four talks in Pittsburgh, Pa., two talks in Detroit, Mich.; Radio talk with question and answer period (suggested by Dr. Plunkett, New York); Radio talk on negro tuberculosis problem—Pittsburgh, Pa.; National Life and Accident Company offer radio station—Nashville, Tenn.

Posters and Posterettes: State Department of Labor and Industry distributes posters (11 x 14); Railroads place posters in waiting rooms and shops—Texas; Special poster for "L" billboards—Brooklyn, N. Y.; Illuminated billboards—Pittsburgh; 2,000 posters, 9 x 12, on trolley car dashboards—Connecticut; Poster in every schoolroom and circular for every pupil—West Virginia; Posterettes through light company—Florida; Posterettes through light company with statements—Massachusetts; Posterettes on state health department mail—West Virginia; Windshield posterettes distributed to all autos by garage men—Massachusetts; Posterettes to be used in schools and in pay envelopes of large industries; A. & P. stores each display two posters—Detroit, Mich.

Films: Show film before state and local medical associations and societies; show film in jail—St. Louis, Mo.; Show film in hospitals to internes and nurses—St. Louis, Mo.; Show film to mothers' club in schools—St. Louis, Mo.; Tuberculosis clinic units of State Department of Health show medical film in every county of state—Tennessee.

Coöperation of Motion Picture Theatre Owners: Motion picture theatre owners send letter with slides to operators to assure use; Lecture and films presented to theatre audiences.

Coöperation by Special Groups: Corporations conduct series of E. D. C. meetings for

employees (600 in one Maryland meeting); Ministers mention E. D. C. in churches; Detroit Council of Churches—Detroit, Mich.; Federation of Women's Clubs—Detroit, Mich.; Insurance company's examiners gave talks to agents who carried message and distributed literature to policy holders; Public meeting for health play and movie—Lowell, Mass.; Noon meetings at industrial plants—New Jersey; Distribution of literature to employees—West Virginia; County health unit paid for half of supplies—South Carolina; University of Alabama School of Medicine asked for copies of Diagnostic Standards; Ask council of Lions Clubs to offer prize for best publicity in weekly community papers—Chicago, Ill.; Airplane bombing of cities with tuberculosis literature and prizes for marked copies—Minnesota and Troy, N. Y.; Coöperation and endorsements from druggists for window display—chain stores and state druggists association (Pennsylvania), retail druggists association (Newark, N. J.); Coöperation of Dental Society—speaker, posters, and article in magazine—Chicago, Ill.; Class discussion of E. D. C., Normal School—Newark, N. J.; Prizes for essays on tuberculosis offered by county association—California; Talks to foreign groups with interpreter—Michigan.

Coöperation by Individuals: Prayer by the Rev. S. Parkes Cadman; Special coöperation on Pacific Coast by Dr. Shepard, Welfare Division representative of Metropolitan Life Insurance Company, show film and distribute posters and posterettes; E. D. C. proclamation issued by governor—Wisconsin; Special interview released by state health officer—Wisconsin; School Commissioner sent letter to teachers asking them to use posters and distribute literature.

Coöperation by Medical Societies: American Hospital Association urged members to distribute literature through clinics and outpatient departments and to old patients and medical and nursing staffs; State Committee of Health sent out "Tuberculosis Abstracts" with weekly letters to officers of all county medical societies during March—Iowa; State Medical Association sent out two tuberculosis articles as part of publicity services—Indiana; Special meetings for physicians arranged through county medical societies; Insert "Appeal to the Medical Profession" in copy of *State Medical Journal*; State-wide committee consisting of heads of various medical and health organizations; Speakers bureau for physicians; Special regional post-graduate tuberculosis clinics for doctors connected with medical societies.

Types of Endorsements: American Public Health Association—story in JOURNAL and editorial; American Medical Association—story in

Journal; State Medical Societies—Pennsylvania, Massachusetts, Louisiana, West Virginia, Iowa; State Medical Associations—Georgia, Louisiana, Idaho; Gorgas Memorial Fund—sent out publicity and stressed tuberculosis in talks; Pennsylvania State Federation of Labor sent letter to each local and E. D. C. literature and posters; State health departments in West Virginia, New York, Iowa, Ohio, Utah, Maryland, Florida; State Health Department of Pennsylvania sent "Appeal to the Medical Profession" to 12,000 doctors in state; State Drug-gists Association—Pennsylvania; State Department of Labor and Industry, Pennsylvania, distributed 10,000 posters; State Association of Boards of Health—Massachusetts; Baltimore City Medical Society; State Federation of Women's Clubs; Pennsylvania Congress of Parents and Teachers—sent letter to locals urging special E. D. C. March meetings; State Y. M. C. A. sent letter and samples of E. D. C. literature and posters to all regular, railroad and college local associations; Detroit Council of Churches; Knights of Columbus; American Hospital Association; Maccabees program—Plan of E. D. C., talk on symptoms, play, distribution of literature.

Magazine and Newspaper Publicity: Special "boiler-plate" sent out by Pennsylvania and Wisconsin; Special manual on Health Endeavors written for Boy Scouts—Michigan; Special "Broadside" for teachers—Michigan; House organs carry items; The Doctor Speaks, special pamphlet for doctors and patients urging sanatorium treatment, not home treatment, offered to locals by New Jersey; Full page ads. donated by papers—New Jersey; Pennsylvania Railroad News ran editorial; Special articles by physicians used in newspapers—Missouri; Metropolitan Life gave ads. in March magazine (articles and editorials in magazines); Offer to papers box mat and six daily items on symptoms to be run under it—Ohio; Send locals general stories with definite release dates—Ohio; Special weekly sets of fillers to newspapers—Kansas; Send out reprints of two Medical Journal articles on E. D. C.—West Virginia; Special E. D. C. circular for negroes, New York Tuberculosis Association; Special plate material—4 articles by prominent physicians—Wisconsin;

Let Your Doctor Decide: Working through 150 service clubs arranged meetings for distribution of circular—Alabama; Circular distributed by state labor department and insurance companies—Washington, D. C.; Distributed through schools, social and civic organizations; Sent out in letters by locals—Delaware County, Pa.; Through morning butter and egg men—Chicago, Ill.

Special Stationery: Special envelope—Pennsylvania; Special letterheads by state associations—Michigan, Alabama, West Virginia.

Miscellaneous: Three puppet shows—Wisconsin; Cards in buses—New Jersey; Appeal to the Medical Profession distributed to every doctor in city and state; Tie-up with "Girls Health Trail," special window display used—Chicago, Ill.; Combine second Christmas seal follow up and E. D. C.—Atlanta, Ga. and Minneapolis, Minn. Special letter to territorial nursing supervisors of Metropolitan Life Insurance Company to cooperate with local associations.

"The Most Valuable Eyes in the World"—An exhibit usable in fairs and expositions was worked out in cooperation with the Health Shop of the East Harlem Health Center of New York City.

The Health Shop put up a booth on the pavement outside of its building which was used for exhibits along various health lines, each exhibit staying in place for two weeks' period and then giving way to another health organization. When the National Society for the Prevention of Blindness was called on, two nearly life-size cut-outs were placed in the booth demonstrating proper posture in the school child and correct use of light both in the home and at school. At either end of the booth facing up and down the street a mirror was placed, underneath the note in large lettering, "The Most Valuable Eyes in the World" and at the top of each mirror was written "See!" These mirrors attracted people's attention to a great extent and persons passing up and down the street stopped to notice the cut-outs.—

Eleanor P. Brown.

AWARDS

A liberal share of awards was made to health organizations in the awards made by the Committee on Publicity Methods at the recent meeting in Memphis. The report of the Committee on Awards included the following:

House organs or official bulletins sent to contributors: In this group the *Quarterly Bulletin* of the Milbank Memorial Fund stands out above all other entries as a piece of printing. Throughout its pages type matter and illustrations are nicely balanced. Its appearance and readability might have been still further improved by a judicious use of sub-heads, but in the main it is excellently done

and monotony is avoided by varying the size and form of the cuts, and by the use of both single and double columns of type, with ample margins of white space. The booklet also rates well in literary quality and adaptability to its purpose. It is easily entitled to first prize.

Annual reports: Of the score of entries we like best *A Year in Review* put out by the National Society for the Prevention of Blindness. It is a report that commands attention and our guess is that it rarely finds itself in the waste basket until it has been read or at least thumbed over. On every point this booklet scores high, and it is especially commendable for its use of photographs in illustrating the work. And it is worth what it cost.

The Community Health Association of Boston is accorded first honorable mention for its interesting use of art work and color. This is a fine example of letting the picture tell the story.

Booklets issued as part of a year-round publicity program: Iowa Tuberculosis Association carries off third honors with a series of leaflets, folders and other printed matter. This in spite of a quatrain that appears on the same page with the rather famous soliloquy of a cent.

Printed Novelties: Our second choice is the annual report of the Visiting Nurse Association of Omaha, not because it is patriotically printed in red, white and blue, but because it tells the complete story in a brief and novel form.

TIMELY TOPIC

Beware the Mad Dog—*Weekly Health Review*, Detroit Department of Health. April 7, 1928.

MOTION PICTURES

A brief department, "Amateur Film Making," by Dwight R. Furness, now appears in *Educational Screen*, 5 South Wabash Ave., Chicago, Ill. 25 cents. Some suggestions on acting for a picture appear in the April issue. *For some uses* amateur productions can be quite helpful. (*We would like to show an amateur picture at Chicago in October.*) Mr. Furness will supply a constitution for a local amateur movie club.

If you need light on motion picture portrayal of your health activities—

especially if located in a community chest city—you will wish a copy of the report on a recent review of such pictures. Sent *free* by Committee on Publicity Methods, 130 East 22nd St., New York, N. Y.

The Children's Bureau is producing a film to show that the breast fed baby is the best fed baby not only because it is much easier for the mother to nurse her baby than to prepare formulas and sterilize bottles, but because the baby who is breast fed has four times the chance for life that the bottle fed baby has. A sequence on manual expression is to be included.

"Sniffle's Snuffles" is the recent addition to the New York State Department series of short pictures. This presentation of facts about common colds is a combination of cartoon animation and living silhouettes, with a thread of story. The series is planned for theatre presentation—with a maximum of entertainment, a minimum of length and one basic health idea in each picture. The producer, Carlyle Ellis, reports that about 25 states are using it.

A 7-minute picture, "Beware the Pitfalls," released by the New York Tuberculosis and Health Association, was produced by Carpenter and Goldman under the technical supervision of Dr. Iago Galdston, secretary of the Health Education Service of the Association. "Beware of the Pitfalls" dramatizes a number of vital statistics of children under 10 years of age through animated drawings. The animation represents a procession of children moving in silhouette across and upward in the direction of a stronghold labeled "Health Maturity." As they move on, numbers of them are shown falling out of line and into pits. These pits are each labeled, "Diphtheria," "Measles," "Scarlet Fever," etc., and are referred back to the actual numbers and rates for each illness.

LAW AND LEGISLATION

JAMES A. TOBEY, LL.B., DR.P.H.

Triumph at Hand—With surprising equanimity and nary a wrangle, the Parker Bill, already adopted by the House, was passed by the United States Senate on April 24, 1928. The Senate did, however, write in a number of amendments which had been suggested or demanded by Senator Smoot. With one or two exceptions, none of these amendments is of vast significance and most of them actually improve the bill. On April 28, however, the House voted to disagree with the Senate amendments and both branches thereupon appointed conferees. An agreement was soon reached and the Senate accepted the report on May 7, and the House on May 10. The bill then went to the President for signature.

The most important amendment insisted upon by Senator Smoot is a provision limiting the tenure of office of the Surgeon General of the Public Health Service to 8 years, or 2 terms. Another amendment restricts the number of sanitary engineers, dentists, and other non-medical scientific personnel who can be given a commissioned status to a total of 110, with only 6 allowed above the grade of surgeon and none above the grade of medical director. Pharmacists may not be appointed above the grade of passed assistant surgeon.

Hearings on the Ransdell Bill (S. 3391) to create a national institute of health were held the latter part of April.

France Wants Its Ministry of Health Back—Five years ago a ministry of health was created for the first time in France. Two years later, when the ministry of M. Poincare fell, the ministry of health was combined with

that of labor, and labor soon proceeded to submerge health in the ministry. Now, according to the Paris correspondent of the *Journal of the American Medical Association*, writing in the issue of April 7, 1928, the French Academy of Medicine demands that a separate ministry of health be set up again because the public health services of France have become badly disorganized during the past 3 years. The Academy cites the interesting fact that only 3 million francs are allotted by the French government for public health, whereas 300 million francs are appropriated for social assistance and public welfare.

Ventilating Congress—When a little item of \$323,000 for a system of improved ventilation in Congress came up in the House on April 14, the members immediately displayed unusual interest in public health. The proposition was warmly debated and there was much discussion of an investigation of the air in Congress made for the Public Health Service by a committee consisting of C-E. A. Winslow, chairman, Frank Irving Cooper, A.M. Feldman, D. D. Kimball, F. R. Still, R. E. Hall, and A. C. Willard. There were also many references to testimony by Dr. L. R. Thompson and Dr. Leonard Greenburg at the hearings which had been held on the appropriation measure in which this sum occurs.

Opposition to this outlay came from Representative Summers, who is a physician, and from Representative Bloom, who is or has been in the theatrical business. During the debate the following interesting dialogue occurred:

Mr. Summers of Washington—"But I would not spend a third of a million

dollars to turn the heat off in my home.”

Mr. Taylor of Colorado—“I would spend a million dollars to save the health of the American Congress.”

The House evidently thought it was worth the \$323,000 because they passed it. Would they be as eager to appropriate comparatively as much for the health of the 110,000,000 or more people of the United States as for the 531 members of Congress?

Relief for Drug Addicts—In the 3 federal prisons in this country there are 3,778 hospital beds, but the number of inmates is 7,598 and of this number 1,559 are drug addicts. These facts were brought out at hearings held on April 26 on H. R. 12781, Representative Porter's bill for 2 federal narcotic farms. Col. L. G. Nutt of the Bureau of Prohibition, various prison wardens, alienists, and others indorsed the measure.

The conservative and indifferent attitude of European nations precludes any effective international regulation of narcotics, according to Assistant Surgeon General Rupert Blue in testifying at the hearings on April 28. He appeared in support of Mr. Porter's bill. Such international efforts as there are dealing with the traffic in opium were outlined in a letter sent by Secretary of State Kellogg to Senator Smoot on April 4. This letter appears in the *United States Daily* of April 5, 1928.

Hospitals for Veterans—The lady from Massachusetts, Mrs. Rogers, arose in the House on April 16 and moved that the rules be suspended and H. R. 12821 be passed. It was. This bill contains authorization for an appropriation of 15 million dollars for additional hospitalization facilities for world war veterans. Last year a similar bill carrying, however, only 11 million dollars, passed the House but failed in the Senate on account of the filibuster with which the Senate then closed its attention to the

public welfare. That filibuster apparently cost the country at least the 4 million dollars added to this hospitalization bill.

Adoption of a bill, H. R. 12627, to establish a medical corps in the U. S. Veterans' Bureau was urged at hearings on April 12. Among those favoring this measure were Dr. Llewellys F. Barker, Col. R. U. Patterson, Dr. W. F. Lorenz, Dr. Kennon Dunham, and Dr. B. W. Black, the last named now being medical director of the bureau.

Other Health Bills in Congress—The bill, H. R. 8128, to authorize an appropriation for the Gorgas Memorial Laboratory, which has passed the House, was passed by the Senate on April 24, the same day the Parker bill was adopted. The resolution for a monument to General Gorgas was reported to the Senate on April 27 and passed a few days later.

Authority to mail poisons under rules and regulations of the Post Office Department is contained in a bill, H. R. 10441, reported to the House on April 18. The bill would permit manufacturers to mail to physicians and others drugs and other articles of a poisonous nature. A similar bill, S. 3127, passed the Senate on May 10.

Members of the civilian army, that is, reserve officers, national guard, and those attending citizen's training camps will be entitled to government medical care for injuries or disease according to S. 2948, which passed the House on April 16. On April 21 the House passed a bill, H. R. 12063 for the relief of the widow of Surg. M. W. Glover of the U. S. Public Health Service.

A joint resolution designating May 1 as Child Health Day was adopted by Congress and President Coolidge issued a proclamation to this effect on April 28.

The bill, S. 3554, for an investigation of cancer, was reported to the Senate on April 12.

Hearings on the Haugen bill, H. R. 10958, to widen the provisions of the Oleomargarine Act were held on April 17 and 19. One witness contended, according to the *United States Daily*, that the bill was designed to aid the members of the Institute of Margarine Manufacturers in a bitter trade war against certain independent firms.

Food and Drug Laws and Public Health—Whether or not food and drug legislation belongs to the domain of public health has always been something of a moot question. In an interesting paper which was presented before the Food and Drugs Section of the A. P. H. A. and has been printed in the *Home Economist* for April, 1928, Walter S. Frisbie, Ph.B., discusses all aspects of this subject and reaches the conclusion that, "the enforcement of the food and drugs law, at least those of a general or non-specific character, is not essentially a health department function."

In spite of this fact, 17 states have entrusted their food and drug legislation to state health authorities. The Federal government, on the other hand, has turned the administration of the national food and drug laws to bureaus of the Department of Agriculture. During the 20 years or more of federal activity in this matter, the health factor has rarely been involved, according to Mr. Frisbie. When public health has been concerned, the Department of Agriculture has frequently called upon the U. S. Public Health Service for aid. Such coöperation, also existing between federal and state and city governments, ought to be extended, in the opinion of this writer.

Although the economic phases of food and drug legislation may be of paramount significance, Mr. Frisbie points out that, public health may be affected by foods which contain poisons, are infected with pathogenic organisms, or are possessed of toxins, and he closes his article with the suggestion that "the

relation of food and drug laws of even the broadest or most general type cannot be ignored in any comprehensive program of public health work."

Liability for Water-borne Typhoid—Any corporation, either private or municipal, in the business of supplying water for human consumption will find it a good investment to employ adequate methods to protect the purity of the water. The first cost and the operating expenses of chlorination, for instance, are fairly certain to be far less than the award for damages to parties injured by polluted water. Such, at least, has been the experience of a number of careless corporations who permitted typhoid fever to be spread by their water supplies.

Court decisions in 8 states during the past 40 years have settled the law of liability for water borne typhoid. An individual or corporation supplying water for people to drink must exercise every reasonable effort to ascertain the quality of the water and take every possible precaution to render it safe. While not a guarantor of the purity of the water under the legal doctrine of implied warranty, the corporation which furnishes it is liable for negligence in exercising due care to apprehend and avert danger.

The decisions of all the courts of last resort on this important matter up to 1927 are summarized and discussed in a comprehensive article in *Public Works* for April, 1928. The Wallace & Tiernan Company of Newark, N. J., has asked permission to republish this article and reprints of it may be obtained from that organization.

Miscellaneous Items—Washington is living up to its reputation as a center for high-powered conferences. From April 2 to 5, 1928, the Children's Bureau held its fifth annual conference on maternity and infancy. Forty-two coöperating states and 3 still outside the fold

sent official delegates. Cancer was the topic for a conference called by the Surgeon General of the U. S. Public Health Service on April 9, 1928.

Surgeon General H. S. Cumming departed for Europe on April 20 to attend meetings of the Health Section of the League of Nations. He was to return the latter part of May.

Sanitary Engineers of the U. S. Public Health Service have been assigned to assist the Office of Indian Affairs in connection with various sanitary improvements at schools and on Indian reservations.

Hygienic Laboratory Bulletin No. 150, entitled "Key-Catalogue of Insects of Importance in Public Health" by C. W. Stiles and A. Hassall has recently been issued by the U. S. Public Health Service. This publication is said to be of value to lawyers interested in nuisances and medical jurisprudence.

A pension due a health department employe under the New York City

charter cannot be withheld by the commissioner of health on the grounds that the employe was suspected of having indulged in questionable activities, according to *Graef v. Department of Health*, 227 N. Y. S. 82, decided by the New York Supreme Court in January.

An excellent summary of tendencies in workmen's compensation laws is given in *Insurance Bulletin No. 32* of the Chamber of Commerce of the United States. This bulletin has a valuable tabulation of compensation provisions.

Summer Public Health Institute—Half a day will be devoted to public health law during the second Public Health Institute for health officers and other public health workers to be held at the Massachusetts Institute of Technology from July 2 to 24, 1928. Persons interested should communicate with Professor S. C. Prescott at M.I.T., Cambridge, Mass.

CONFERENCES

June 4-9, Biennial Nurses Convention, Louisville, Ky. (American Nurses Association, National League of Nursing Education, National Organization for Public Health Nursing)

June 8-9, Conference of State and Provincial Health Authorities of North America, St. Paul, Minn.

June 12, American Heart Association, Minneapolis, Minn.

June 12-14, Ontario Health Officers Association, 14th Annual Meeting, Toronto, Ont.

June 18, Regional Meeting, American Public Health Association, Portland, Ore.

June 18-23, National Tuberculosis Association, Portland, Ore.

June 20, Canadian Tuberculosis Association, Charlottetown, P. E. I.

June 26-28, New York State Conference of Health Officers and Public Health

Nurses, Saratoga Springs, N. Y.

July 1-6, National Education Association, Minneapolis, Minn.

August 6-10, American Hospital Association, San Francisco, Calif.

October 15-19, American Public Health Association, Chicago, Ill.

FOREIGN

July 8-12, Congrès International de la Protection l'Enfance, Paris, France.

July 8-13, First World Congress of Social Workers, Paris, France.

July 16-21, Thirty-ninth Congress Royal Sanitary Institute, Plymouth, England.

July 28-August 4, World Federation of Education Associations, Geneva, Switzerland.

December 28, International Congress of Tropical Medicine and Hygiene, Cairo, Egypt.

BOOKS AND REPORTS

Standing Room Only?—By Edward Alsworth Ross. New York: Century, 1927. 368 pp. Price \$3.00.

In this book the author has given us a study of the growth of population as compared with that of food supply. His survey covers practically the entire world, and he shows, as others have done, that the population almost everywhere is increasing at a tremendous rate, owing largely to the advances in preventive medicine. He proves that in many parts of the world, particularly those inhabited by the brown races, the population is already greater than the food supply, though there is no indication of any effort to control this increase. Indeed preventive medicine is enlarging its boundaries at a tremendous pace, and infants whose lives ordinarily would have been sacrificed are now saved to grow up and propagate their kind. In two of the most overcrowded countries, India and China, there are habits, beliefs, and superstitions, which practically compel large families, as sons are necessary to perform certain rites—ancestor worship, for example.

The author is a strong believer in birth control and many arguments are brought forward to sustain his point of view. Excerpts from a number of letters written to Mrs. Sanger by women in many stations of life are quoted. He seems too much inclined to regard this measure as a panacea for the ills of which he writes. He is a great admirer of Malthus, though he considers the famous *Essay* as no longer fit to guide us, since so many new factors have arisen which interfere with the predictions made by its writer. He feels, however, that Malthus has left an enduring mark upon the dynamics of

population, a statement with which all students will agree.

Professor Ross is a well-known maker of phrases, and a fluent writer. Unfortunately, the medical part of his argument is marred by mistakes such as are so commonly made by non-medical men. For example, on page 34, he gives the date of the discovery of the bacillus of whooping cough as 1906, while on page 35, he classes whooping cough as among the diseases still under discussion, though believed to be of parasitic origin. He gives 1919 as the date of the discovery of the cause of yellow fever, though this alleged discovery has been completely discredited. On page 36, the word "toxin" is loosely used.

The book includes a number of articles previously printed in various magazines. It can be recommended as interesting reading, and as giving many facts on a question which is much under discussion in every part of the civilized world. The advances of preventive medicine in life-saving certainly bring with them problems which must be answered in the near future, since our population is increasing at a rate, which if unchecked, will soon leave us with "standing room only."

M. P. RAVENEL

Fighters of Fate—By J. Arthur Myers, Baltimore: Williams & Wilkins, 1927. 318 pp. Price \$3.00.

The art of the world has gained and also suffered because of the fact that many men of genius have been afflicted with tuberculosis. While suffering from this disease, Frederic Chopin, produced some of his most marvelous compositions, and John Keats wrote his "Ode to a Grecian Urn." But Chopin died

prematurely at 39, and Keats at 25. History is replete with similar occurrences.

Tuberculosis is not the reason for genius, but sometimes, as in the case of Eugene O'Neil, the playwright, the rest required allows the development or realization of native powers. The consumptive of the 18th and 19th centuries usually fought a losing fight, though in many instances he attained great things despite his adversity. The tuberculosis patient of today has better than an even chance to achieve greatness and overcome the disease and many of them, such as Roger W. Babson, Harold Bell Wright, Will Irwin, Albert E. Wiggam, Lawrason Brown, and McDugald McLean, have done so. The biographies of these men and others, twenty-four in all, are presented in this volume by Dr. Myers, himself one of the fighters of fate. Except for St. Francis of Assisi, who was born in 1182 and died in 1266, most of the subjects mentioned belong to the latter part of the 18th or early part of the 19th century. The lives of poets and musicians, writers and physicians, an empire builder and a baseball player, are passed in review in an interesting, if somewhat sketchy, manner.

The book is simply written, with the chief incidents of the various biographies concisely presented. While it lacks some of the romance which might have been woven into the story, it is well worth perusal. The book is well printed. There is an introduction by Dr. Charles H. Mayo.

JAMES A. TOBEY

Critical Studies in the Legal Chemistry of Foods—By R. O. Brooks, B. Sc. New York: Chemical Catalog Co. Inc., 1927. 280 pp. Price \$6.00.

This is a compilation of articles published in trade journals, chiefly in 1922 and 1923. It covers only a small portion of the food field; includes fruits and fruit products, condimental sauces,

edible oils, cacao products, spices and maple products.

Because of being a reprint of material prepared some five or six years ago, which in turn referred to other material, then, five, ten or more years old, much of the book is now quite out of date.

The scheme followed in each chapter is to define the basic natural food materials used, to describe the technology employed in preparing these for market, and to give the tolerances (usually and improperly called "standards") which for the information of the trade have been issued by the federal government; together with some argument as to whether in the author's opinion, those tolerances are fair and proper.

The many food inspection decisions of the federal government regarding tolerances for those food products discussed in the book appear to be correctly quoted and to many readers may prove to be the most valuable portion of the book. However, these can be secured, without cost, by interested parties who write for them to the U. S. Department of Agriculture. The value which these tolerances might have in the book is, however, distinctly reduced by reason of the fact that the author is not content to quote those now in force but repeatedly confuses and befogs the issue by quoting old, discarded tolerances in which he, as well as the government which superseded them with other and better ones, had in the past found some weakness. Against these old and abandoned "standards" the author directs the shafts of his criticism *in extenso*. It is believed that this constitutes the basis for the use of the word "critical" in the title of the book.

There is a tendency throughout the book to overemphasize the difficulty of the examinations which must be made to detect adulteration. As an example, in the chapter on spices, the author takes the position that to discover the adulteration of cloves with excessive amounts

of clove stems requires the services of a "skilled spice microscopist." The fact is that any careful, conscientious laboratory helper, charwoman or other person of ordinary intelligence and average eyesight, with very little instruction, and certainly without the aid of a microscope, could do the job well.

There is an appendix of some 40 pages containing reprints of articles by other authors, chiefly on the technology of preparing fruit beverages, jellies and mayonnaise and on the labelling of beverages and beverage materials.

Those who believe that the enforcement of the Federal Food and Drugs Act has been constructive in its conception, just in its execution and salutary in its effect, will not agree with the author's statement on page 64.

H. W. REDFIELD

What You Should Know About Health and Disease—*By Howard W. Haggard, M.D., with an introduction by Yandell Henderson. New York: Harper, 1928. 538 pp. Price \$5.00.*

Since the war we have had a veritable deluge of books pertaining to health, a few of which have been very good, but most of which have been mediocre or even poor. The present volume comes to us in a jacket, for which the author must be at least indirectly responsible, which would lead us to expect a good deal of it, since we are told that it "extends over the whole field of modern medicine" and "makes available to the general reader in one volume the knowledge which modern medical science has accumulated."

It is dedicated to Professor Yandell Henderson, who is thanked for his service in "its delivery." Just what the "delivery" of a book means is hard to say. Professor Henderson writes a rather fulsome introduction, in which, after naming certain classes of readers, he ends by commending the book to the "whole educated public." We believe

that the uneducated public is the section of the community which most needs a book on health.

It is interesting to study the different points of view from which books on health are written. The present book leans decidedly to physiology. We believe that no sound hygiene can be taught without at least a fair knowledge of anatomy and physiology. These two subjects are well and adequately treated. The public health side strikes us as being spread in a very thin layer. There are many things to which exception might be taken. Cocksure statements are made on subjects concerning which experts speak carefully. There are a number of misspellings, some of which may be passed by as typographical errors, though we can see little excuse for them even on that ground. Other errors, however, are so often repeated that one cannot blame the printer or a careless proof reader. One also finds terms which are not used in modern books. We cannot see why statistics for 1908 should be quoted when those for 1926 or 1927 are available.

The make-up of the book is excellent and the illustrations are good.

M. P. RAVENEL

Dunn's Food and Drug Laws, Federal and State (Annotated)—*Prepared and Edited by Charles Wesley Dunn, M. A. In 3 volumes. Vol. 1, Federal. Pp. 775; Vol. 2, States, Alabama-New Hampshire. Pp. 1618; Vol. 3, States, New Jersey-Wyoming, Appendix-Index, Pp. 3418. New York: The United States Corporation. 1927. Price \$50.*

To find the complete written law on any one subject in this country, it is usually necessary to consult, as a conservative estimate, not less than 250 volumes. This is because the written law in the United States is scattered in the codes and session laws of 48 states, in those of the several territories, and

in the statutes of the federal government. This legislation is, furthermore, often reinforced by administrative rules and regulations, and by executive decisions. Finally, it is also subject to the interpretation and application by courts of last resort.

When, therefore, an attorney performs the very real service of bringing together all of the laws and regulations, properly annotated, on any one subject, he deserves a vote of thanks from all persons interested and concerned. This is especially the case when the compilation is accurate and conveniently arranged.

Frequent consultation of *Dunn's Food and Drug Laws* by the reviewer has shown that these three volumes are indispensable to anyone dealing with food and drug legislation. This monumental work is of great practical value and should be in many libraries, despite its considerable, though proper, cost. The books are well printed, apparently reasonably free from errors, and the subject matter is unusually complete.

The fact that nearly 6000 pages are needed to present one single phase of law is an interesting commentary on American law-making proclivities.

JAMES A. TOBEY

The Prohibition Mania, A Reply to Professor Irving Fisher and Others—By Clarence Darrow and Victor S. Yarros. New York: Boni & Liveright, 1927. 254 pp. Price \$2.50.

This book is a devastating criticism of Professor Irving Fisher's *Prohibition at its Worst*, as well as of Professor Fisher himself. Point by point his claims are taken up and their unfairness, their lack of logic and scientific accuracy are shown up. In doing this, a number of well-known writers on economics, medicine, psychology, etc. are quoted. One of the most striking of these quotations is taken from Professor Willcox of Cornell University, one of our

best known statistical authorities. On various points, authors like Pearl, Stockard, Pearson, Starling, Münsterberg, and others are quoted. A considerable amount of space is devoted to criticisms of the charts given by Professor Fisher to prove his case. It is brought out that many of these charts are based on the work of R. A. Corradini, who is connected with the World League Against Alcoholism, and further that they do not represent actual figures. In fact, they are spoken of sometimes as "estimates" and in one place as a "shrewd estimate." Indeed it is shown that most of them are simply guesses with little or no foundation in fact.

The study of the use of alcohol is not confined to the United States but examples are drawn from a number of other countries also. We can commend the book to all who wish to know both sides of this burning question. A note is inserted stating that while the book was in the hands of the publisher a new edition of *Prohibition at its Worst* came out, in which the charts have been changed. Readers are advised to use the first edition of Professor Fisher's book, though the authors feel that the new edition with the changes "will hardly deceive intelligent people."

The authors are both well-known. They write as "convinced individualists" and in the reviewer's judgment, they make out a good case.

M. P. RAVENEL

American Red Cross Text Book on Food and Nutrition—By Ruth Wheeler. Philadelphia: Blakiston, 1927. 123 pp. Price \$.60.

This is a book which gives a definite working knowledge of the selection of foods, and would be an excellent text to place in the hands of the worker who wishes to organize nutrition classes, or the nurse who needs lists and charts, and the recent thought on food selection.

D. D.

Percival's Medical Ethics—*Edited by Chauncey D. Leake. Baltimore: Williams & Wilkins. 1927. 291 pp. Price \$3.00.*

This book is divided into three parts—the first an introductory essay on ethics and medical ethics; the second, Percival's Medical Ethics, with a facsimile of the original title page; and lastly, appendices giving the so-called Pagan Oath of Hippocrates, the oath in so far as a Christian may take it; the code of ethics of the American Medical Association, adopted May, 1847; the principles of ethics of the same association for 1903 and 1912, revised to date. A reproduction is given of the manuscript form of the earliest extant version of the Christian Hippocratic oath, taken from a manuscript of the 10th or 11th century preserved in the Vatican.

In these days when medicine is being so largely regarded as a business instead of a profession, this volume is particularly timely, and we feel that the author has done a service in collecting this material and presenting it in such good form. It represents a great amount of labor. Not being a physician, he apologizes for discussing what some may consider a strictly medical subject, but he approaches it in a sympathetic manner and in the attitude of one who is connected with medicine. There is little question that medical ethics are misunderstood by laymen as well as by many physicians, and that some, even of the latter, do not appreciate the underlying principles, which we believe are founded on the Golden Rule. The letter of Percival accompanying a copy of his *Manual* sent to his son, enumerates a number of advantages which will follow the study of professional ethics, and result in "that propriety and dignity of conduct which are essential to the character of a Gentleman."

A distinction is drawn between medical etiquette, involving physicians

alone, and matters of ethical significance to humanity, but which are often confounded in practice.

The book can be read with advantage as well as pleasure by all professional people. To the general public and especially that portion of it interested in history, it can also be highly recommended. It is beautifully printed, and contains a number of unusually interesting illustrations.

In connection with this book, we wish to call attention to an article by Acting Dean Carey, of Marquette University, on the use of the Hippocratic Oath in medical schools. Thirteen of 79 schools require their graduates to take the Oath before the degree in medicine is conferred. Some other schools contemplate its use, and still others read it to freshmen and to seniors on special occasions. Some modifications, which embody the essential principles, are employed.

M. P. RAVENEL

Report of the Medical Research Council for the Year 1926-1927. —*London: His Majesty's Stationery office, 1928. Price 3s.*

Annual reports are often dreary reading, but the volume before us is a notable exception. Some parts of the report, such as that on Artificial Vitamin Production, for example, have the value of original articles. The subjects considered require two full pages, and they cannot even be mentioned in a review. We can only say that from cover to cover this Report is full of valuable facts and suggestions for further research work.

We know of no other body which, since the World War, has contributed more to public health than the Medical Research Council of England. It has the best research minds in the kingdom working earnestly under a council of notable scientific men, headed by the Earl of Balfour as Chairman.

M. P. RAVENEL

Annals of the Pickett-Thompson Research Laboratory, Volume III (complete). Baltimore: Williams & Wilkins, 1927. 316 pp. Price \$10.00.

This monumental work, devoted entirely to the streptococcus group, shows the thoroughness characteristic of English research. In some ways it is rather disappointing, since it does not take into consideration the pathogenic varieties as was intended, since such an enormous amount of material was found, that another volume devoted entirely to pathogenic streptococci will be issued in 1928. The authors believe that there are hundreds of more or less definite varieties, and while they consider their work imperfect, have grouped approximately a hundred varieties in this volume.

Dr. Warren Crowe has devised a differential medium, which is expected to greatly aid in the differentiation of the many streptococci known to exist. About one-half of the work had been completed before Dr. Crowe took part in it. It is believed that the identification of all streptococci is beyond the power of any single individual.

This volume is indispensable for anyone pursuing this line of investigation. Twenty-one pages are devoted to bibliography, and about one-fourth of the entire volume is given to microphotographs, some of which are made from growths on Dr. Crowe's differential medium, and are colored. Descriptions accompany every photograph.

The volume shows an enormous amount of research, and we hope that some specially gifted person will make an abstract of it which the ordinary bacteriologist can utilize. In its present form it seems to us that it is suitable only for reference, and confess that the collection of this material does not clarify our ideas to any great extent. Since streptococci cause so much disease, death and misery to humans and animals alike, and as the editor states, "are the greatest and most dangerous of

mankind's invisible foes," no bacteriological study is more deserving of attention.

The volume on the pathogenic streptococci will be awaited with eagerness, and the two volumes will constitute the most important study made on this group of organisms which has yet appeared.

M. P. RAVENEL

This Smoking World—By A. E. Hamilton. New York: Century, 1927. 227 pp. Price \$2.50.

A. E. Hamilton is not a sanitarian nor does he write from special knowledge on the subject of tobacco. He accepts the orthodox majority viewpoint and expounds it in a humorous, whimsical style that calls forth no effort of intelligence to mar the reader's enjoyment. Tobacco, he feels, needs no defense. "The brief history of four centuries shows ample compensation for any physical harm tobacco may have done in the friendliness and fellowship which it has prompted among men." But he recommends that we smoke for enjoyment and not by habit. A "temperate practice" is, he admits, more difficult to form than an "automatic habit," but it is not impossible.

When the orthodox view has no scientific foundation, as in the case of juvenile smoking, Mr. Hamilton does not attempt to construct one, but after making fun of the reformers for their unproved assertions, he proceeds cheerfully to make another equally unproved one on his own account. "The use of tobacco," he says, "acts as a primary or contributory cause to a great deal of mental and bodily disturbance, amounting often to retardation and sometimes to pathological consequences." It is the accepted dogma and as juveniles are about the only class of people who do not contribute to the literature on tobacco, it is likely to remain so.

This Smoking World will appeal especially to the moderate smoker. He will

find justification for his habits, useful hints on the selection of cigars, and advice on the best way to take care of his pipe. The reformer will be frankly annoyed by the writer's levity. The scientist, though he will find diversion in an hour of leisure, will not find much else.

ROSSLYN EARP

The Harvey Lectures—*By various authors. Series XXII. Baltimore: Williams & Wilkins, 1928. 164 pp. Price \$4.00.*

The Harvey Lectures long ago won their place. The series for 1926-27 is fully up to the standard set in the past. While it may be invidious to select certain of them for special mention, we believe the first, fifth and sixth will be more generally interesting, largely because they come within the scope of the average man's training. The sixth lecture entitled "Organic Chemistry" gives a clear idea of the development of synthetic drugs and of chemotherapy. The lecture of Professor Neufeld is notable as a posthumous tribute to Koch, but shows surprising ignorance of American work. Among the 32 references, none is to an American author, and only 3 to English, yet we cannot but express the opinion that this country has for many years past held its own in this as well as other types of research.

M. P. RAVENEL

Bacterial Vaccines and Their Position in Therapeutics—*By Leonard S. Dudgeon, C.M.G., C.B.E., F.R.C.P. Lond. New York: Hoeber, 1927. 87 pp. Price \$2.50.*

We can commend most heartily this short book on the modern vaccine treatment of disease. It is notable for its saneness and conversativeness. Vaccine therapy has, we believe, come to stay, but has been injured by the misleading claims of manufacturers, and also by the undue enthusiasm of certain of its advocates.

The present book commends itself to the critical man by the absence of these faults. The author uses formalin to kill his cultures, and does not believe that sensitized vaccines are superior to others. He is convinced that the auto-genous vaccine is superior to the stock variety. He holds that vaccines have no place in the treatment of acute infections, and protests against their use in disorders, the etiology of which are unknown or indefinite, such as pernicious anemia, goiter, and chronic intestinal toxemia.

The book can be commended as eminently sane and practical. It is one of the series of Modern Medical Monographs, edited by Hugh Maclean, M.D., D.Sc., Professor of Medicine, University of London.

M. P. RAVENEL

Problems of Social Well-Being—*By James H. S. Bossard, Ph.D., New York: Harper, 1927. 654 pp. Price \$3.50.*

This book is one of the Harper Social Science Series, edited by F. Stuart Chapin.

The author states that it is the outcome of years of teaching university students such courses as social pathology, poverty and dependency, social maladjustment, etc. He finally discovered that three basic factors could be identified—economic, physical, and psychological—so that he finally formulated the idea that income, health and mental hygiene are the bases of social well-being. These he has emphasized, and discussed quite fully.

The book naturally falls into three parts, dealing with these three subjects, preceded by an introduction.

By far the largest part of the book is given to part II, which reads more like a history of medicine than a book on sociology, discussing as it does, the control of disease, immunity, the communicable diseases, nutrition, etc. The book is admirably written, and in spite of

some shortcomings which must be pointed out, we confess to much pleasure in seeing this type of work find its way into the hands of sociologists.

The book consists too largely of quotations, and largely from works written by men who have not had medical training; therefore certain things are emphasized incorrectly, or at least with doubtful accuracy. The reader is forced to suspect that the author has not properly digested his material.

A good deal of the material is old, and on that account, incomplete and incorrect. Sometimes instead of quoting from the original, second-hand information is given.

Calmette's vaccine against tuberculosis is spoken of only in regard to cattle and monkeys, though reports on several thousand children have been available for a year or more. The latest information on sanocrysine is a quotation now three years old, which states that it is a new and promising treatment, based "on principles which appear to be sound theoretically and successful in practice." In the meantime many experiments have been carried out, both in Europe and in this country, and the drug has been generally discredited. Some distinctly dangerous statements are made, as when the proper temperature for pasteurization of milk is given as 140° F. for 20 minutes. Not even those who are trying to lower the temperature below the widely accepted 145° F. for 30 minutes, ask so great a reduction.

When medical matters are treated of by a writer who is not a medical man, such things must be expected. The section on Mental Hygiene shows better consideration.

Altogether, the volume contains a large amount of reliable information, well thought out and well presented. We cannot help wondering why the author wandered into the discussion of certain cures which were not proved, instead of sticking to facts which were at hand. In a second edition, which the book deserves, such errors should be eliminated. We hope for the book a wide circulation among those who insist on talking about medical matters without having had adequate training.

The printing and binding are excellent, the paper being of medium weight with mat surface. M. P. RAVENEL

Sunshine and Health—By Ronald Campbell Macfie, M. B., LL. D. New York: Henry Holt, 1927. 256 pp. Price \$1.00.

This charmingly written little book is a volume of the Home University Library of Modern Knowledge. The chief criticism that one can make of it is that its title does not describe its contents. It contains a great deal of physics, history, philosophy and some religion. We confess that we do not quite understand what is meant by "the religion of radiation" or the "metaphysics of the sun."

The most practical part of the book is chapter IX, which treats of light therapy. The book can be commended for the vast amount of interesting information crowded into its 256 pages, though we believe that the average buyer will be disappointed if he depends upon the title.

It is excellently printed on light paper with mat surface.

M. P. RAVENEL

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

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ALEXANDER, F. W. *The Value of Sunlight.* Med. Off., 30:14 (Apr. 7), 1928.

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BIGELOW, G. H. *Are "Alcohol Deaths" Due to Alcohol?* New England J. Med., 198:5 (Mar. 22), 1928.

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DUFFIELD, T. J. *How Much Air Does the School Child Need?* J. A. M. A., 90:16 (Apr. 21), 1928.

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HADLEY, P. *The Twort-D'Herelle Phenomenon.* J. Infect. Dis., 42:4 (Apr.), 1928.

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HALPERN, L. J. *The Prevention and Modification of Measles by Measles Antidiplococcus Goat Serum.*

Use of Cod Liver Oil—An interesting account of the early rise and fall of cod liver oil therapy and the steps that led up to the recent reawakening of interest in this valuable preventive measure against rickets.

HARDING, T. S. *A History of Cod Liver Oil Therapy.* Scient. Monthly, (Apr.), 1928.

Early Diagnosis of Tuberculosis—A plea that medical students be taught adequately to diagnose and treat tuberculosis, to be taught to suspect tuberculosis. The education of the laity is also discussed.

HAWES, S. B. *Suspecting Tuberculosis.* New England J. Med., 198:7 (Apr. 5), 1928.

Endamebic Dysentery—This paper summarizes the life history of the dysentery ameba and its effect upon the human organism. The importance of stool examination is stressed.

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JOHNSTONE, J. *Some Notes on a Light Treatment Clinic.* Med. Off., 39:13 (Mar. 31), 1928.

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KOZŁOWSKI, A. *The Effect of Ricinoleated Vaccine of the Hemolytic Streptococcus (Scarlet Fever) on Animals.* J. Immunol., 14:2 (Mar.), 1928.

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MEYERS, J. Cancer Death-Rate Variations in Relation to Combustion Products of Fuel, Topography and Population. *New York State J. Med.*, 28:7 (Apr. 1), 1928.

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ORTON, S. T. Specific Reading Disability—Streptosymbolia. *J. A. M. A.*, 90:14 (Apr. 7), 1928.

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BOOKS RECEIVED

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LA VACCINATION PREVENTIVE CONTRE LA TUBERCULOSE PAR LE "BCG." By A. Calmette. Paris: Masson et Cie, 1927. 233 pp. Price, 22 Fr.

THE HEALERS. By B. Liber. New York: Rational Living, 1928. 454 pp. Price, \$3.00.

PHYSIOLOGY. By V. H. Mottram. New York: Norton, 1928. 279 pp. Price, \$3.00.

COMMUNITY PROBLEMS. By Arthur E. Wood, Ph.D. New York: Century, 1928. 589 pp. Price, \$3.75.

ANTHELMINTICS AND THEIR USES IN MEDICAL AND VETERINARY PRACTICE. By R. N. Chopra and Asa C. Chandler. Baltimore: Williams & Wilkins, 1928. 291 pp. Price, \$5.00.

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FILTERABLE VIRUSES. Edited by Thomas M. Rivers. Baltimore: Williams & Wilkins, 1928. 428 pp. Price, \$7.50.

DIETETICS FOR THE NURSE. By I. Stewart, London: Faber & Gwyer, 1928. 200 pp.

LABOR PROTECTION IN SOVIET RUSSIA. By George M. Price, M.D. New York: International Publishers, 1928. 128 pp. Price, \$1.25.

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LIVING WITH OUR CHILDREN. By Lillian M. Gilbreth. New York: Norton, 1928. 309 pp. Price, \$2.50.

INDUSTRIAL NURSING. By Florence Swift Wright, R.N. Re-issue. New York: Macmillan, 1928. 179 pp. Price, \$1.50.

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Connecticut—The 41st report (49th year) of the Connecticut Department of Health for the fiscal year ending June 30, 1926, is bound in cloth covers and occupies 399 pages including a table of contents at the front and a subject index at the back. Good readable type, numerous illustrations in the form of photographs, statistical charts and tables are features. Individual reports from bureau heads are included, together with a report of a survey of the incidence of endemic thyroid enlargement in the State made in coöperation with the U. S. Public Health Service.

Commendable results in the child hygiene and public health nursing fields are reported. A plan for the extension of public health nursing to the communities where it is needed has been prepared whereby the state reimburses the smaller towns for a part of the cost of service. The plan is such that the town accepts it voluntarily if it desires the aid provided by the state.

Figures are presented to show what the state is losing from *preventable* deaths, the method of evaluation into dollars being that of the National Conservation Commission. According to this scheme an adult life is considered worth \$5,000, a child life from \$1,000 to \$3,000, and an infant, \$500. The averages for the periods 1915-19 and for 1920-24 are given, and a comparison is made with the situation in 1925. The majority of the diseases discussed show favorable balances. Under the heading of Savings Effected, the loss column shows that the state still has problems in influenza, venereal diseases, cancer, and diseases of the circulatory and nervous systems. It is calculated that the net savings represented by lessened deaths amounted in 1925 to over 3 million dollars. Total savings each year

since 1922 amount to over 11 million dollars. "Accounting of this sort cannot estimate the amount of time or wages lost on account of preventable sickness. However, it may safely be said that with improvement in preventable deaths, some savings must be made in preventable sickness. Connecticut has had another favorable year."

Middletown, N. Y.—An illustration of an attractive, dignified, but inexpensive annual report, is that of Middletown, N. Y., for 1927. A brief review of public health trends and of local problems precedes the account of the year's work. "Large sums are spent in drives for better business, teams are organized to canvass the city, but what does this avail if we do not have healthy citizens, with earning capacity and buying power? Our two years without a case of diphtheria are not noticed by business, but how business would sit up and take notice if we had 80 cases at one time—which is the record of a little more than a decade ago!"

The diphtheria immunization work has been noteworthy. At present, as each birth certificate is filed, a card for it is indexed so that when the baby reached 6 months of age its parents receive a request to have it protected either by the family physician or the health department. A monthly mimeographed bulletin is distributed, briefly stating the health condition of the city and of the surrounding section. New activities of the board, and a short article on some timely health subject are also included.

Pittsburg County, Okla.—The 3rd annual report of the Pittsburg County Coöperative Health Unit for the fiscal year ending June 30, 1927, indicates

the benefits of organized county health service. The personnel for this county of 52,000 people consists of a medical director, a nurse, a sanitary inspector and a secretary. The area covered is 1,370 square miles. There are 136 schools with a total enrollment of 10,000. It is stated that much progress has been made in sanitation throughout the county, especially in the small towns. This work has included improvement in dairy conditions as well as in the installation at schools and private homes of sanitary conveniences. During the three years that the Unit has been active, 5,059 persons have received complete anti-typhoid inoculations. "In reality the typhoid cases in the county proper show a decrease of 50 per cent." Maternity and infancy work has gradually increased. A large per cent of the women are of foreign nationality and difficult to reach. This work consists of group conferences as well as office consultations. During the year, in connection with the child hygiene work, 146 lectures have been given with an attendance of over 6,000 persons, while 4,326 children have been examined.

Kansas—The 41st and 42nd annual reports of the State Board of Health of Kansas for the periods ending July 1, 1926, indicate that no unusual epidemics prevailed during the biennium. In 1925, a new low death rate from diphtheria was recorded, 3.5 per 100,000 population. During the fiscal year 1926, 10 Kansas counties operated under a full-time health administration plan, in coöperation with the U.S.P.H.S. and the Rockefeller Foundation. The report abounds in detailed statistical tables and graphs with descriptive text. One noteworthy feature is a brief comparison of full-time and part-time county health units in Kansas. "It is found also that wherever a full-time, active, competent county health officer is appointed, he lowers the infant mortality promptly

and speedily accelerates the diminution of the death rate from tuberculosis. He engages in effective measures for the education of the public in health matters and generally succeeds in a striking manner in increasing the span of life of those who reside in the community which he serves."

Delaware—The State Board of Health report for the two-year period ending June 30, 1926 is bound in cloth covers and occupies 150 pages. During this period a full-time director of tuberculosis work has been added to the staff; a medical director of child hygiene was appointed; the laboratory has been moved to Dover, and newly equipped; new legislation was passed; and a successful campaign for diphtheria prevention was inaugurated. Two noteworthy features of the report of the secretary of the board are a list of recommendations regarding new legislation, and a tabulation of office activities, including the number of letters, records, and reports received. By such tabulations, it is possible to formulate an impression regarding detailed routine activities, which are often important as well as time-consuming. A financial statement, classified as to functions, precedes the body of the report.

Child health conferences were conducted in 18 health centers. A motor truck is also used for itinerant clinics throughout the state. Of the 44,361 children reached by the Bureau, 14,313 were preschool, and 3,184 infants under one year of age. Excellent photographs of the clinics, sanatoria and laboratory are published.

Regular inspections were made of oyster plants and samples are taken from the various oyster shucking houses, from the beds on which oysters are grown, and from the water above the beds. Examinations were made of all employes to determine whether they were carriers of typhoid fever. The

plants were certified by the State, the certification being approved by the U.S. P.H.S. and forwarded to the oyster shucking plants.

Newark—Newark's 42nd annual report of the department of health has several noteworthy features. Preceding the main report is a page headed Newark—A Healthy City, Outstanding Evidences in 1926. Here are given the population and vital statistics data. Then follow pages giving a table of contents, a brief health officer's statement, and the organization and personnel of the department. The report is printed in good readable type and contains several excellent statistical graphs to illustrate the text. A classified financial statement shows the total disbursements through the health department of this city of 460,000 population to have been \$419,771.

An adjusted death rate of 11.1, and a birth rate of 22.7 per 1,000 population are recorded, with an infant mortality rate of 71.9. The specific death rate from typhoid was 1.5; from tuberculosis (all forms), 91.5; from diphtheria, 4.6, and from scarlet fever, 1.1 per 100,000 population. Rabies is said to be increasing, and the advantages of inoculation are detailed. Accidental deaths during 1926 numbered 304, representing a decrease of 39 over the previous year. Organic heart disease was the leading cause of death (984), followed by pneumonia, (675), cancer (498) and pulmonary tuberculosis (368). Death rates from all causes and from certain special causes are tabulated for each year beginning with 1894. Infant mortality is analyzed according to color, age and cause. It is interesting to note that the infant mortality rate for infants supervised by the Child Hygiene division was 60.3 (27.0 under 1 month) as compared

with a rate of 78.9 (40.4 under 1 month) for infants not supervised by the Division. Reports from each division of the department are included and serve to make a very readable volume.

East Harlem, N. Y.—An interesting report of a vital statistics study bears the title: Casting the Life Lines for East Harlem. This study, following a period of approximately 5 years' work of the district health center, is presented as an index for measuring the effectiveness of coördination and intensive health endeavor. This district includes 8 sanitary areas comprising 87 city blocks, with an area of 4½ acres and a population of approximately 108,000. An encouraging part of the picture is the improvement shown in the majority of the areas of the district. In 1925, five of the areas had a general mortality from 3 to 5 points below their rate in 1920, from 1 to 3 points below the city's 1925 rate, and from 4 to 6 points below Manhattan's. The lowest death rate (9.03 per 1,000 population) appeared in an area where an intensive nursing and health demonstration has been conducted since the beginning of 1923. Marked improvements are noted for pneumonia and for diarrhea and enteritis. The general mortality rate for the 5 year demonstration period was 18% lower than that of the 5 year pre-demonstration period. Detailed statistical tables and graphs form a valuable part of this report.

"Obviously the life lines in East Harlem are being strengthened and lengthened.—This study of vital statistics is one more bit of evidence that coördination of the work of health and welfare agencies and intensive health service administered according to a district plan will definitely improve the health conditions of a community."

NEWS FROM THE FIELD

CONFERENCE ON LIGHT AND HEAT

AN invitation has been extended to all American doctors by the *British Journal of Actinotherapy* to attend the 2nd International Conference on Light and Heat in Medicine, Surgery and Public Health, which will be held in London, England, October 29-November 1, 1928. The University of London will be conference headquarters. There will be an exhibition of the most up-to-date apparatus and accessories for ultra-violet, radiant heat and kindred forms of therapy. Several well-known English and Continental specialists will lecture and take part in the various technical sessions. Visits to representative clinics will be arranged to give delegates to the Congress an opportunity to see the methods of utilizing the light and heat for therapeutic purposes.

LOS ANGELES HELPS IN FLOOD AREA

THE Los Angeles County Health Department, under the direction of Dr. John L. Pomeroy, health officer, has assumed full sanitary control of that portion of the flooded area in Los Angeles County affected by the breaking of the St. Francis dam. Dr. Pomeroy's force is reported as having done excellent work in safeguarding the health of the residents in this area and having accomplished thorough and quick results in providing for the sanitation in the county.

NORTHERN CALIFORNIA PUBLIC HEALTH INSTITUTE

THE Northern California Public Health Association is holding a Public Health Institute, May 29-June 8. Sessions will be held daily from 3 to 4:30 in the afternoon, and each evening from 7:30 to 9 o'clock. The afternoon

sessions will be primarily for professional people such as teachers, nurses, health officers, bacteriologists, social workers and other interested public health employees. The evening sessions will be open to the general public and will be of general interest. Dr. Haven Emerson of Columbia University, New York, N. Y., will conduct the Institute.

CANCER SOCIETY OFFERS PRIZE FOR POSTER

IN coöperation with the Art Alliance of America, the American Society for the Control of Cancer has offered cash prizes of \$500, \$250 and \$100 for the best poster designs for use in its cancer campaign.

Particulars may be obtained on application to the New York City Committee of the Society, 34 East 75th Street, New York, N. Y.

HEALTH EDUCATION SCHOLARSHIPS FOR WOMEN

THE Massachusetts Institute of Technology, through its Department of Biology and Public Health, has announced the establishment of two full tuition scholarships for women in the field of health education—one or both of these scholarships to be awarded on or before the last day of July, 1928, according to standards and procedures arranged by the Scholarship Committee and the Department of Biology and Public Health. The amount of each is \$400.

NATIONAL LEPER HOME AT CARVILLE

ACCORDING to a recent report by Surgeon General H. S. Cumming of the U. S. Public Health Service, there were 56 lepers admitted to the hospital at Carville, La.; 12 patients were readmitted and 2 were discharged on parole,

as their leprosy was arrested, so that they were no longer considered a menace to the public health. There were 17 deaths there last year.

It is of interest to note the nativity of the 278 patients now at this hospital. They come from 20 states and 3 United States insular possessions. Louisiana, Florida and Texas lead the states furnishing patients and twenty-four foreign countries have sent patients.

IMPROVEMENTS ON INDIAN RESERVATIONS

An agreement has been reached between the Office of Indian Affairs of the Department of the Interior and the U. S. Public Health Service of the Treasury Department, whereby certain sanitary engineer officers of the U. S. Public Health Service will assist the Bureau of Indian Affairs in connection with pure water supplies, proper and adequate sewage disposal, and other sanitary improvements on many of the Indian reservations and at various Indian schools, throughout the country. This will obviate the necessity of the Office of Indian Affairs building up its own force of sanitary engineers, or having to procure such assistance from outside sources.

During the past year a number of surveys were made by Sanitary engineer officers of the U. S. Public Health Service in connection with improvements at several Indian Reservations. On the basis of these surveys, appropriations were asked from Congress for the installation of new water systems and sewage disposal systems on several of the reservations surveyed.

77 PER CENT OF TEACHERS RETIRE BEFORE AGE 55

A record of the ages of 357 New York State public school teachers retired on pension during the past 6 years because of disability shows that 276 or over 77 per cent were retired before the age

of 55, according to Dr. William A. Howe, State Medical Inspector of Schools. Only a small group of 19 (5.3 per cent) retired after they had reached the age of 60. Discussing the report Dr. Howe said:

These figures clearly indicate that a vast majority of teachers fail in health at a period of their lives when senile changes are as a rule not operative. They impress us with the great loss, much of which by proper health teaching is preventable, that the teaching profession is each year suffering. They still further emphasize the need as well as the opportunity . . . and duty, of systematically aiding teachers to more carefully safeguard their health.

GEORGIA HEALTHMOBILE

THE fifth annual health tour of the Georgia State Board of Health's "healthmobile" opened April 9 and will close November 7.

COMMUNITY HEALTH MEETING

THE Allegany-Garrett County Medical Society and the health department of Cumberland, Md., sponsored the fourth annual community health meeting on May 10, at the state armory, Cumberland. The speakers were: Senator Royal S. Copeland, New York, N. Y.; Morris Fishbein, M.D., Chicago, Ill.; and James Hall Mason Knox, Jr., M.D., Maryland Health Department.

DELAWARE INSPECTS TOURIST CAMPS

DELAWARE health authorities have taken the initial steps for the protection of health of campers, tourists and vacationists who may stop in the state, by demanding that operators of summer or tourist camps file applications for permits to operate such camps, so that inspection of the sanitary and health conditions can be made immediately. John S. Fulton, M.D., director of the State Department of Health has announced that to be duly certified each camp must satisfy the requirements of the State Board of Health as to protection of water supplies from pollution;

disposal of sewage; protection of food supplies from contamination, and general cleanliness. A licensed camp will be given a placard bearing the state seal and the statement, "This camp has been inspected and approved by the State Board of Health."

DR. DAVIS DIRECTS VITAL STATISTICS OF TEXAS

W. A. Davis, M.D., formerly city health officer of Fort Worth, Tex., has been appointed director of the Division of Vital Statistics of the Texas State Department of Health.

Dr. Davis at one time served as health officer of Atascosa County, Tex. He has also served as State Registrar of Births and Deaths, Secretary of the Texas State Board of Health and at one time was Director of the Bureau of Vital Statistics in Georgia.

TOLEDO PUBLIC HEALTH ASSOCIATION

THE Toledo Public Health Association and its affiliated agencies, through legislation, has obtained the appointment of a full-time health officer. Dr. Paul F. Orr has received the appointment of Commissioner of Toledo on a full-time basis. Dr. Orr was formerly associated with the Michigan State Department of Health.

CANCER CAUSES GREAT ECONOMIC LOSS

CANCER in 1927 was responsible for a monetary loss of about \$800,000,000, according to a recent announcement made by Louis I. Dublin, Ph.D., Statistician, Metropolitan Life Insurance Company. This represents an economic loss as great as if 300,000 workingmen had been idle for a year. Dr. Dublin also stated that \$680,000,000 represents the monetary cost of persons dying from cancer, and that \$110,000,000 was spent in caring for the victims. He is of the opinion that the current year will undoubtedly see

a greater economic loss and a greater amount of suffering, since cancer is on the increase.

DR. MASON JOINS ROCKEFELLER FOUNDATION

PRESIDENT Max Mason of the University of Chicago has resigned to become head of the newly created Division of Natural Sciences of Rockefeller Foundation, New York, N. Y. Dr. Mason was elected president of the University of Chicago in August, 1926, to fill the vacancy caused by the death of President Ernest de Witt Burton.

INSTITUTE ON SOCIAL HYGIENE

A SOCIAL Hygiene Institute will be held at the Chautauqua, N. Y., July 9 to August 17, under the direction of the American Social Hygiene Association in coöperation with New York University, Chautauqua Institution and the Chautauqua Summer Schools. The courses to be given by Dr. Thomas W. Galloway and Newell N. Edson will be credited as two points by New York University.

The titles of the courses are "Sex and Education," "Special Problems in Social Hygiene," "Interpreting the Family to Children," and "Parenthood and the Character Training of Children." This is the third annual institute held by the A. S. H. A. at Chautauqua.

COLLEGE TO COÖPERATE WITH STATE

AMONG the recommendations made in the recent survey report on higher education in relation to the Medical College of Virginia at Richmond are that the college take over the state public health laboratory now maintained by the Virginia State Board of Health and that the school of nursing be more generously developed on the side of pediatrics and obstetrics, to make possible more affiliations in these subjects with the smaller hospitals of the state.

PERSONALS

- DR. FRANCIS D. COMAN of Johns Hopkins University Hospital, Baltimore, Md., has been chosen medical officer to accompany Commander Byrd's expedition to the South Pole.
- DR. ALFRED C. REED, a former member of the faculty of Stanford University, has been appointed Professor of Tropical Medicine in the Hooper Foundation for Medical Research, University of California. This announcement was made by President William W. Campbell of the university. Dr. Reed is at present studying at the London School of Tropical Medicine.
- DR. JAMES J. DURRETT, Memphis, Tenn., has succeeded Dr. George W. Hoover in charge of the Food, Drugs and Insecticide Administration, U. S. Department of Agriculture. Since 1920, Dr. Durrett has been city supervisor of health in Memphis and professor of public health at the University of Tennessee.
- DR. J. C. ANDERSON, State Health Officer and V. M. Ehlers, Chief Sanitary Engineer, Texas State Board of Health, attended the first short school for Sanitarians recently held at Tuscon, Ariz., under the direction of the state health officer and Jane H. Rider, director of state laboratories.
- C.-E. A. WINSLOW, Dr. P. H. of Yale University has been awarded the Ling medal by the Ling Foundation of Los Angeles, Calif. in recognition of his "unselfish work in behalf of the health progress of school children."
- DR. ANNA EARL PURDY, an intern at the Norwegian Hospital, Brooklyn, N. Y., is the first woman physician to be awarded a three year surgical fellowship at the Mayo Foundation, Rochester, Minn. Her work starts in October of this year.
- DR. EDWARD L. KEYES has been appointed consulting urologist to the State Department of Health in New York State.
- DR. MALCOLM IRVINE has been appointed health officer of North Powder, Ore.
- DR. ABRAHAM METZ, city chemist of New Orleans, La., has been forced to resign that position because of ill health. He has held this position for 36 years.
- DR. PAUL H. MEANS, Cambridge, Mass., has been appointed medical adviser to Harvard University to succeed Dr. Marshall H. Bailey.
- DR. FRANCIS D. DONOGHUE has accepted the appointment as representative of the United States at the Fifth International Conference for Medical Science as applied to workmen's accidents and occupational diseases, to be held at Budapest, Hungary, in September.
- DR. FREDERICK L. WEBBER has been appointed police surgeon of St. Paul, Minn.
- DR. JOHN J. TOPHAM, South Berwick, Me., has accepted the appointment of university physician in the University of New Hampshire, Durham, N. H., to succeed the late Dr. Nathan L. Griffin.
- DR. FRANCIS S. FERRIS, Glenside, Pa., has been appointed chief medical examiner for the Philadelphia and Reading Relief Association, to succeed Dr. Casper Morris, resigned.
- GEORGE H. CRAZE, field representative of the Texas Public Health Association has resigned to become executive secretary of the Texas County Public Health Association with headquarters at San Antonio. This organization is affiliated with the Texas Public Health Association and the National Tuberculosis Association.

DR. DANIEL CONNELLY, health officer of Kingston, N. Y., since July 1923, died on March 22, after a week's illness.

DR. FRANK L. KELLY of Oakland, Calif., relinquished his position as health officer on April 1, to take over the duties of health officer of Berkeley, replacing Dr. James R. Scott.

DR. FANCHER is the new health officer of Oakland, Calif.

DR. FRANK R. WOOD, Heflin, Alabama, has been appointed health officer of the new Cleburne County health unit.

ERNEST L. WALKER, Sc.D. of the University of California Medical School has just returned from a 14 months' stay in Honolulu, where he carried on investigations as to the cause of leprosy at the invitation of the U. S. Public Health Service.

DR. ALBERT L. MORGAN has resigned as health officer of Dexter, N. Y., where he has held this position for more than 35 years.

DR. JOHN N. SHUMWAY has completed his 30th year as health officer of Painted Post, Steuben County, N. Y.

DR. GEORGE R. ALBERTSON who has been acting dean of the school of medicine of the University of South Dakota for two years, has been appointed to the position of dean, to succeed the late C. P. Lommen.

DR. EUGENE DAVIS has assumed charge of the U. S. Veterans' Bureau Hospital No. 88 at Memphis, Tenn.

DR. GUY W. HENIKA, Madison, Wis., has been appointed assistant state health officer of Wisconsin.

DR. ROBERT L. FRISBIE, Humbird, Wis., has been appointed deputy state health officer.

BERNARD C. ROLOFF, formerly superintendent of the Illinois Social Hygiene League of Chicago, is now in charge of the Department of Publicity and Publications of the City Health Department of Chicago. Mr. Roloff has also accepted the position of execu-

tive secretary of the Chicago Boy's Federation, and is now busily engaged in preparations for their big exposition and celebration to be held the week of May 21-28.

DR. F. R. SMYTH, director of Bureau of Communicable Diseases of the North Dakota State Department of Public Health, Bismarck, N.D., died recently.

DR. ADOLPH J. LIEBER has been appointed health officer of the city of Des Moines, Ia.

DR. VICTOR H. HASEK has been appointed health officer and city physician of Cedar Rapids, Ia.

DR. ALDO CASTELLANI recently completed a series of lectures on tropical medicine in Madrid, Spain, under the auspices of the Royal Academy of Madrid at the invitation of the Queen of Spain.

HOMER FOLKS, secretary of the State Charities Aid Association, New York, N. Y. was awarded the service medal of the Rotary Club of New York at a recent meeting of this club with the State Conference on Crippled Children.

DR. GEORGE EMMETT BETHEL, director of the university health service of the University of Texas, has been appointed by the board of regents of the university, as dean of the state medical college, Galveston.

POSITIONS WANTED

Services of thoroughly qualified graduate sanitarian soon will be available. Experienced in state and municipal public health work, housing, sewerage and sewage disposal, social surveys, municipal waste collection and disposal, sanitary inspections, reports, investigations, etc. Excellent at organization and administration. Let's get together and talk it over. Address 50 W. F.

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HEALTH OFFICER, trained and experienced in epidemiology, venereal diseases, immunization, chemistry, bacteriology, school hygiene, sanitation and vital statistics desires larger opportunity. Young, congenial and with good health. Address 55 H. D.

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Yonkers, New York

American Journal of Public Health

and THE NATION'S HEALTH VOL. X NO. 7

Volume XVIII

July, 1928

Number 7

Bacillus Calmette-Guérin (B.C.G.)

Animal Experimentation and Prophylactic Immunization of Children

An Analysis and Critical Review

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Research and Clinical Laboratory of the Trudeau Sanatorium, Trudeau, N.Y.

THE feverish enthusiasm manifested in the wholesale antituberculosis vaccination in European countries, and mainly in France, has accomplished one very good purpose. It has administered a stimulus to the stagnant question of prophylactic immunization.

The literature on B.C.G. vaccination is rapidly accumulating. Nearly 100,000 infants have been treated by this method. It is surprising that only a small number of them have come up for a statistical study. The favorable results reported have been gained largely from impressions and not from facts. On account of the many inquiries which have come to our attention the present review has been written.

The gradual decline year after year in the mortality from tuberculosis as shown by reliable statistics, is the best index that the campaign adopted years ago is sound and effective. This campaign has also influenced the death rate due to other causes, with the exception of heart disease and cancer. Education, sociological activities and various health measures stimulated by prosperity have played an important part in the improvement of living conditions and in the prolongation of life. However, this decline of mortality from tuberculosis has in no way influenced the investigator to discontinue his search for a method which can be safely used for vaccinating children against tuberculosis.

Attempts at prophylactic immunization against tuberculosis date from the time of the discovery of the microorganism. Koch, Pasteur, Trudeau, Dixon, Maragliano, Pearson and Gilliland, Theobald Smith, Calmette, Römer, Baldwin, Webb and Williams and many others have tried to devise some method which could be used safely for this

purpose. Many methods have been studied and recommended. The methods which most demand our attention today are three: Vaccination with (1) virulent living, (2) avirulent living, and (3) heat-killed virulent tubercle bacilli. In the following pages the discussion will be limited to the method advocated by Calmette and his coworkers, which consists of vaccination with avirulent living organisms.

PREMISES ON WHICH CALMETTE'S METHOD OF VACCINATION ARE BASED

The prevalence of tuberculous infection among children in the civilized world, as demonstrated by the tuberculin skin test, varies considerably. Hamburger and Monti⁷ in Vienna reported 94 per cent positive reactions in children at the age of 12 years. In rural districts in Germany, Römer⁸ found 66 per cent of the children to be infected at the age of 11. Very similar findings have been reported by S. Mueller⁹ in Berlin, Moro¹⁰ in Munich, Petruschy¹¹ in Dantzig and Northmann¹² in Dusseldorf. In Paris 35 per cent of apparently healthy children up to the age of 5 give a positive tuberculin reaction. Arnfinson¹³ studying 8000 children of various ages observed a positive reaction in 33 to 38 per cent. In the United States the incidence of infection detectable by the tuberculin reaction is not so great as that reported in European countries. Veeder and Johnston¹⁴ in St. Louis observed a positive tuberculin reaction in 44 per cent of children from the ages of 10 to 14. Some children with clinical disease were included in this group. Slater¹⁵ studied two groups of children in Minnesota: The first with no history of exposure reacted positively in 10 per cent, and the second who were living in tuberculous surroundings reacted positively in 80 per cent. Myers and Magiera¹⁶ reported 41 per cent in a study of 2000 children in Minneapolis. Still,¹⁷ in a group of 58 children with no history of tuberculosis and living in the lower East Side of New York City, observed only 9.8 per cent positive Pirquet tuberculin reactions.

The foregoing figures reveal the fact that by the time children reach the age of puberty, from 40 to 90 per cent may have become infected, the social and economic conditions mostly influencing the percentage of infection.

Let us for a moment examine the statistics of early infant infection which have stimulated the present activities for prophylactic immunization. McLean and Jeidell¹⁸ examining 2000 infants under 1 year of age found a positive infection in 7.35 per cent, while in a second group of 512 children of 3 years of age it reaches 32.5 per cent. Spolverini¹⁹ found 7 per cent positive reactions in a study of 900 infants of the same age, Sander²⁰ 6 per cent up to 2 years, and Armstrong²¹ 15 per cent for the same period. In New York City, Drolet's

studies²⁶ reveal that from 10 to 12 per cent of all children become infected with tubercle bacilli before they reach 1 year of age. Taking the birth rate of 1923 when 130,000 infants were born, he calculates that in all probability 13,000 of these children became infected during the first year of life.

If we now turn our attention to the study of possible infection in children brought up in a family with a history of tuberculosis, the occurrence of the positive tuberculin reaction is materially increased. Harms and Seitz²⁷ studying 129 infants under 1 year of age reported 60 per cent positive tuberculin reactions, Röpke²⁸ 67.5 per cent and Barchetti²⁹ 73 per cent. The mortality from tuberculosis in the first year of life, after infection has occurred, appears to be very high. Brown³⁰ reports 70 per cent, Hemplemann³¹ 78 per cent, Davis³² 45 per cent, Reuben and Smith³³ 68 per cent, Lemaire³⁴ 57 per cent, Harms and Seitz³⁵ 23.9 per cent, Lozano³⁶ 26 per cent, and Wahlquist and Myers³⁷ 8.4 per cent. Petersen and Ostenfeld of Denmark, as quoted by the *British Medical Journal*³⁸ give only 6.2 per 1,000, while the same authors quoted by Calmette³⁹ give 7.7 per 100.

From these brief statistics it seems that infants are born with no appreciable resistance to an excessive infection. If they are born in families in which the tubercle bacilli are disseminated continuously, infection will probably take place almost immediately. Excessive infection takes place more often from contact with a tuberculous mother, and in the majority of instances a progressive disease is the result, which may later lead to meningitis or miliary tuberculosis. On the other hand, if the infant comes in contact with only a few organisms and at proper intervals, it may escape serious consequences.

Under ordinary circumstances, and not in tuberculous surroundings, without doubt children occasionally pick up a few organisms which find their way to the lymph nodes, setting up a small, non-progressive focus which according to the majority of investigators is responsible for a degree of resistance to progressive disease present in the human race. Statistics show that the percentage of positive tuberculin skin reactions increases with age, and conversely the mortality from tuberculosis diminishes as the child becomes older. It seems then, according to Calmette,⁴⁰ that in humans as in animals, an infection of mild nature is very desirable. The excessive infections must be avoided and the intervals well regulated. The organism used for producing mild infection should be of low virulence and the vaccination must be carried out in infants which have not been infected. The vaccination must be repeated from time to time in order to supply the lymph nodes with living organisms.

Calmette²⁹ is convinced that most of the infection in children takes place by the digestive route, for the reason that the intestinal mucosa of the infant during the first 10 days absorbs the organism much more readily than at any other time during life. If, according to this author, the infection takes place through the intestinal tract, then the same route must be used for vaccination. For this reason and also because of its simplicity, all Calmette's vaccinations have been carried on by feeding the organism to new-born babies. Two factors enter into the discussion when the method of vaccination is based on the use of living microorganisms: (1) Is it dangerous? (2) Is it effective?

I. PATHOGENICITY OF BACILLUS CALMETTE-GUÉRIN (B.C.G.)

The organism was isolated by Calmette and his associates in 1908. It was a bovine organism originally of moderate virulence for guinea pigs, rabbits and cattle, but after continuous cultivation on glycerinated potato bile medium it has lost its power of producing generalized tuberculosis, not only in cattle but also in small laboratory animals. Even in 1913 we find some reference that after 30 to 34 passages on this medium the organism had lost some of its pathogenicity. The authors claim that the environment and the medium have played a great part in the change. In an earlier publication Calmette and his coworkers claimed that the organism did not form tubercles or set up a tuberculin hypersensitiveness. Later they amended this statement in answering some of the objections made on the pathogenicity of this organism. We shall briefly review some of Calmette's experiments."

When the organism was injected into the cellular tissue of the dewlap of newly born calves, it did not disseminate as in the case of a virulent organism, but remained localized at the site of inoculation for a year. Abscesses aspirated revealed acid-fast rods, which were not capable of infecting guinea pigs on subinoculation.

Subcutaneous inoculations of 3 mg. in guinea pigs and rabbits produced very slight, localized lesions in the form of small nodules which disappeared after 2 to 3 weeks. When 5 to 10 mg. were inoculated, edema developed on the following day. Within 10 to 12 days a small abscess appeared at the point of inoculation, breaking externally and suppurating from 2 to 4 weeks and then cicatrizing. The regional lymph nodes became enlarged but not caseous and soon they subsided to normal size. Excessive doses from 100 to 150 mg. after 2 to 4 weeks produced small granular follicles in the spleen, which disappeared in the course of 2 months. When suspected tissues were triturated and inoculated into a second series of animals no progressive disease was noted. However, very often when guinea pigs were inoculated with

doses of 50 mg. or more, many became emaciated and died. Many tuberculous-like changes were present in the viscera but these authors claim that the changes were due to pseudotuberculosis. from which *Bacillus pseudotuberculosis rodentium* was isolated.

Intraperitoneal inoculations of small doses were well tolerated. Three mg. produced nodular reactions in the omentum. Later these nodules increased in size and persisted for 6 months and then completely disappeared.

Intracardiac and intravenous inoculations of 1 to 10 mg. had no ill effects in guinea pigs and rabbits. In about 15 days the lymph nodes at the groins became swollen and remained so for 10 days. This swelling completely disappeared in a few months. In the animals killed at the height of this reaction, the liver, spleen and lungs usually showed follicular lesions which were visible to the naked eye.

Administration per os was well tolerated, even in doses up to 100 mg. After 2 to 3 weeks following the feeding there was a general glandular enlargement, especially in the mesenteric lymph nodes. If the animals were killed during this period, small follicular lesions were found in the viscera and the tracheo-bronchial lymph nodes contained many acid-fast bacilli. All these lesions showed no tendency to progress, and gradually disappeared.

Direct intrapulmonary inoculations of 10 mg. of B.C.G. in half of the animals formed small, deep-seated abscesses. These abscesses were well borne by the animal and never culminated in death unless a superinfection of Pasteurella organisms occurred. In animals which survived 8 months the abscesses containing many acid-fast organisms were still present. In no instance were these authors able to transfer the suspected tuberculous lesions into a second series of animals, nor to increase the virulence of the organism.

Remlinger and Bailly,³¹ Kühn,³² Tzekhnovitzer,³³ Gentili, Gerosa, Mangiarotti, Nai, Setti, Zotini and Bassi,³⁴ Okell and Parish,³⁵ and others have confirmed Calmette's observations. However, there is a group of investigators including R. Kraus,³⁶ Selter and Blumenberg,³⁷ Gerlach,³⁸ Nobel,³⁹ Chiari, Nobel and Sole,⁴⁰ who have been able to produce lesions in guinea pigs and in some instances progressive disease leading to the death of the animal.

The organism is non-pathogenic for monkeys according to Wilbert,⁴¹ who inoculated a number of chimpanzees, baboons and other types of monkeys. All tolerated very well even 100 mg., per os or intravenously. Subcutaneous inoculation produced slight edema with persistence of painless induration. Animals dying from intercurrent disease showed no evidence of tuberculosis.

OCCURRENCE OF TUBERCULIN REACTION IN ANIMAL EXPERIMENTATION

The development of the tuberculin reaction depends on the mode of inoculation. By ingestion a small number of animals become allergic. The same has been the result by the intravenous route. Nélis²² states that tuberculin skin hypersensitiveness appears in adult guinea pigs between the 1st and 2d months and lasts from 6 to 10 months after ingestion of B.C.G.

Tzekhnovitzer²³ claims that guinea pigs become hypersensitive to tuberculin after treatment with B.C.G., the highest intensity occurring from 2 to 4 months. Seventy per cent of those infected orally and 45 per cent of those infected by the subcutaneous route react. The intraperitoneal and intracutaneous inoculations apparently do not sensitize animals to tuberculin. Rabbits do not react very readily to tuberculin after treatment with B.C.G. organisms. The ophthalmic reaction, however, is positive in 100 per cent of all animals.

Bruno Lange²⁴ obtained positive reactions to tuberculin in 100 per cent of guinea pigs inoculated intravenously, in 80 per cent of those inoculated orally and in 62 per cent after inhalation.

In regard to phagocytosis, Metalnikov and Secreteva²⁵ noticed that the cellular reaction is very similar to that observed in animals infected with virulent organisms.

II. IMMUNITY IN ANIMALS VACCINATED WITH B.C.G.

Calmette²⁶ and his coworkers claim that intravenous inoculation of 25 to 30 mg. of the organism in a fine suspension will protect rabbits against 0.001 mg. bovine bacilli which kills controls in 75 days. This resistance began to diminish in about 6 months, after which the lesions due to the virulent bovine infection progressed very rapidly, causing the death of the animal. Subcutaneous and intraperitoneal sensitization was not very effective. Rabbits of 15 to 20 days of age when sensitized by the buccal route by making them ingest organisms dropped with a pipette, resisted subsequent infection of a virulent organism very much like those vaccinated intravenously. If they were inoculated 3 months after the B.C.G. vaccination with a virulent bovine culture, the sensitized animals outlived the controls by 6 months and at autopsy only discrete lesions could be seen.

Guinea pigs were not so suitable for immunization for the reason that they are extremely susceptible to intercurrent infection. The adult guinea pig, following a single intracardiac inoculation of 5 to 10 mg. or by two subcutaneous inoculations of 50 mg. at 2 months-interval, shows considerable resistance to an infecting dose of 0.001 mg. Or still better,²⁷ if very young guinea pigs of 8 to 20 days of age are

given ten feedings of 100 to 150 mg. of the organism with a pipette at 20 hours-intervals, they will resist 0.001 mg. of a virulent culture. The infecting dose may be given either by intraocular instillation of a drop of fine emulsion or may be fed to young guinea pigs. In both instances, according to these authors, the results are very satisfactory.

Guérin, Richart and Bossière " studied a large number of cattle on a farm where the latter were raised for the production of butter. On this farm in 1915, in a herd of 67 head, 47 per cent reacted positively to the tuberculin test. Year after year the reactors were slaughtered. This procedure was not effective in completely eradicating tuberculosis from the farm. In 1919, 38 per cent were still positive to the tuberculin test. In 1920, the number of reactors was increased to 41.7 per cent. Vaccination in the new-born cattle started January 1, 1921. No special precaution, according to the authors, was taken to eliminate the possibility of contamination. In 1922, one year after the vaccination, 20 cattle gave a definitely positive and 9 a very suspicious tuberculin reaction, or a total of 45 per cent of 64 head. Many of those animals were vaccinated and revaccinated. In 1923, there remained 26 of the 1919-20-year animals, all giving a positive tuberculin reaction. In 1924 only 5 reactors were allowed to live with the young vaccinated animals. In 1925, only 2 remained of the original 1919 animals, 3 having been killed. In 1 of the 3 reactors killed, no tuberculosis could be found, in the 2d there were only few tubercles in the lungs, and in the 3rd animal there was an old calcified lesion in the lungs. In 1926, 7 years from the beginning of the experiment, there were still 2 of the infected animals which were reported in the 1919 experiment and which gave a positive reaction to tuberculin.

In the meantime, the second generation of these vaccinated animals were revaccinated and the vaccination repeated each following year. At the time of their report, the group of vaccinated animals consisted of 58 cattle living in contaminated surroundings. There is no record of how many of the vaccinated cattle became infected, as the tuberculin test was not done. These authors omitted the tuberculin test on Calmette's suggestion, as he believes that it is of doubtful diagnostic value, giving no information as far as exogenous infection is concerned. Furthermore, if in the vaccinated cattle an implantation of a virulent organism has taken place, setting up only a benign tuberculosis, tuberculin administered may bring about a violent allergic reaction, disseminating the virulent organisms. In such an event a progressive disease may follow. The validity of the claims for establishing protection in the vaccinated animals was based on autopsies done on a few cattle which have died from intercurrent disease.

Tzekhnovitzer²³ concluded that B.C.G. given orally in young guinea pigs does not prevent oral infection with virulent organisms. The animals may live a little longer than controls but the lesions are very similar to those seen in the control animals. Rabbits vaccinated subcutaneously lived longer than the controls and the lesions were not of the progressive type. In cattle after intravenous immunization with B.C.G. followed by 5 mg. of virulent bovine culture, the controls died in 6 weeks of miliary tuberculosis, while the sensitized animals survived and appeared apparently normal. Two, killed after 3 months, showed nodular tuberculosis. Two, killed 6 months after the virulent inoculation, showed subpleural tubercles, calcified bronchial and mesenteric lymph nodes and a few tubercles in the lung. Another animal killed in the 9th month showed a number of tubercles in the lungs. The last animal killed in the 10th month showed a caseous mass in the left lung. All were apparently in good health when killed.

Watson,²⁴ in a limited number of cattle vaccinated with B.C.G., observed no conclusive evidence of protection. The animals were vaccinated with B.C.G. in the usual way, were kept away from contaminated surroundings for a short period, and then put in with a tuberculous herd, exposing them to natural infection. The animals in the group were killed at various intervals from 2 to 24 months. All were free from tuberculosis.

A second series of animals were treated approximately the same as were the preceding series, kept under observation for 15 months and then killed. Progressive tuberculosis was found in every one of these vaccinated animals. The discrepancy in the two series is explained by the author in that the source of infection was different although the vaccinations were carried out exactly alike.

In a series of 4 unvaccinated new-born cattle which were put in contaminated surroundings and killed some 15 to 20 months later, only 1 of the animals had demonstrable tuberculosis. The author concludes that a large series must be employed and that animals with no natural resistance must be chosen for experiments of this nature. He calls attention to the possibility that the virulence of the organism which causes the infection in a herd may fluctuate from time to time. Tuberculosis may spread very slowly in one herd and very rapidly in another. This variation may be due to the natural resistance which some of the herds possess, the organism causing no clinical manifestation even with its continuous presence. Gradually the animals become resistant to this particular organism. However, as soon as a new organism is introduced into the herd, the occurrence of the disease is much more marked than previously.

Wilbert " reported a study of 15 chimpanzees and 59 Pitheciens in East Africa, which if it can be repeated will strengthen the status of the B.C.G. vaccination. Monkeys of all ages were vaccinated either by a single subcutaneous inoculation of 50 mg. or by five ingestions, each consisting of 15 mg. at intervals of 8 to 10 days, and all showed resistance when exposed to natural contact infection. Some of the monkeys have been under observation since 1924 and were still living and in good health at the time of writing. The life of controls and of infected animals has always been very short. Autopsies on many of the vaccinated chimpanzees which have died from intercurrent diseases showed no tubercular lesion. This author concludes that B.C.G. can establish a definite protection in monkeys.

PREPARATION OF VACCINE AND METHOD APPLIED IN INFANTS

The organism ordinarily is cultivated on glycerin potato bile medium. When a large quantity is desired, especially in the vaccine preparation, it is advisable to cultivate it on a synthetic medium known as "Sauton's." Surface inoculation is made by floating the seed and an abundant growth accumulates in a short time. Only cultures of 3 weeks' development are recommended by the author for the preparation of the vaccine. The fluid medium is removed from this 3 weeks' growth, and a number of sterile glass beads are introduced. The flask is fastened to a shaking machine and after 15 minutes of vigorous shaking it is diluted with a mixture containing 1 per cent dextrose and 4 per cent glycerol in water. The whole mass is well mixed and allowed to stand until the clumps settle. The supernatant suspension of living organisms is then diluted so that 1 c.c. represents 5 mg. moist weight of the bacilli. Two c.c. of this suspension are mixed with milk and fed to infants. The feedings are made on the 3rd, 5th and 7th days after birth. Each feeding represents approximately 400,000,000 of living organisms.

The history of the vaccination of infants with B.C.G. as a prophylactic measure dates from July, 1921, when Turpin and Weill-Hallé fed some infants at the Maternity Hospital in Paris. For the following 2 years the vaccination was practically neglected. It was not taken up seriously until July 1, 1924. In a recent article Calmette²³ and his coworkers tabulate the results from the 3 years' vaccination of 52,772 children, which cover a period from July, 1924, to December 1, 1927. Eight hundred and forty infants were vaccinated in 1924; 4,336 in 1925; 14,654 in 1926; and 32,942 in 1927. Sixty-two hundred and nineteen of the vaccinated were born in tuberculous families, 5,749 of whom have been under observation for 1 to 3½ years. Of these, 3,808

were vaccinated less than 1 year, 118 of whom died, making a general mortality of 3.1 per cent and a tuberculous mortality of 34 infants or 0.9 per cent. Tuberculous meningitis is given as the cause of death in 30 cases or 88.4 per cent of the tuberculous deaths. The remaining deaths were due to some other form of tuberculosis. Of the 84 infants in this group who died from other causes than tuberculosis, 29 or 34.5 per cent died from gastroenteritis.

The remaining 1,941 of these 5,749 infants represent a group from 1 year to 3½ years of age. Twenty-one deaths occurred in this group, or a general mortality of 1.2 per cent, 4 of whom, 0.2 per cent, died from tuberculosis.

In a third group of 917 children from 2 to 3½ years of age there was no tuberculous mortality. It is not quite clear if the third group is included in the second group.

Perhaps the best controlled study on infant vaccination is that made by Weill-Hallé and Turpin.⁴ Their statistics consist of 469 cases vaccinated with B.C.G., 92 of whom they lost track of and could not include in their study. Another group of 60 was excluded because the duration of time after the vaccination was too short. Of the whole group they analyzed only 317 cases which were well followed with the intracutaneous skin test. Death occurred in 14 of these 317 infants. Two hundred and thirty-six were from healthy surroundings and 67 from tuberculous environment. The 14 deaths were equally divided between the two groups, 7 in the first and 7 in the second. The skin test was done approximately every 3 months, and the results are tabulated in the following table:

Age in Months	INTRACUTANEOUS SKIN TEST	
	Infants Vaccinated, Living in Tuberculous Surroundings	Infants Vaccinated, Living in Healthy Surroundings
	Tuberculin Skin Test Positive in Per Cent	Tuberculin Skin Test Positive in Per Cent
3		
6	11.1	2.5
9	16.6	4.1
12	25.9	5.8
15	26.6	7.6
18	44.4	7.4
24	50.0	12.1
	60.0	28.0

A glance at this table shows that the tuberculin skin reaction was positive more frequently in the group of children who were in tuberculous surroundings than in the group in which apparently there was no source of infection. The tuberculin skin reaction does not give us any information, especially in the group vaccinated and living in healthy surroundings, as to whether the infection was due to B.C.G. or to an exogenous source. Sixty per cent of children at the age of 2

years living in contaminated surroundings have reacted positively to tuberculin. This probably means that a large percentage of infection in this group was of exogenous character. It does not vary in any way from the group of children who have never been vaccinated and have lived in tuberculous surroundings. It seems that in spite of the vaccination with B.C.G. and the sociological measures, the implantation with virulent tubercle bacilli has taken place.

Selter,⁴⁹ analyzing these figures, offers the same criticism. It would be interesting for this author to follow not only the children brought up in surroundings where the possibility of infection is great, but also in the second group which give no history of infection.

Sayé, Domingo and Miralbell,⁵⁰ using Calmette's method, vaccinated 203 children with B.C.G. Six deaths from tuberculosis occurred among the vaccinated, or approximately 3 per cent. A number of the infants died from gastroenteritis but unfortunately no record is given as to the nature of this gastroenteritis.

Moine⁵¹ in a study of 882 infants reports a mortality from tuberculosis in only 0.8 per cent. Biraud⁵² reports 2.46 per cent mortality from tuberculosis in a group of 1872 vaccinated infants. Ott⁵³ gives a mortality of 1.9 per cent from tuberculosis in 157 infants. Rougebief,⁵⁴ following 60 cases of 623 vaccinated infants in Algeria gives no mortality from tuberculosis. Blanc,⁵⁵ in Greece, reports no mortality from tuberculosis in 136 infants vaccinated. Cantacuzène⁵⁶ reports no tuberculosis mortality in 578 infants. Keller⁵⁷ also reports good results but he believes that living B.C.G. vaccination should be controlled with killed organisms. Bernard⁵⁸ had no accident in 20,000 children vaccinated in Indo-China. Malvoz and Van Beneden,⁵⁹ in Belgium, report only 1 death from tuberculosis in a group of 374 vaccinated infants, and Iakhnis,⁶⁰ of Lithuania, studying 472 vaccinated infants, reports that he obtained ten times more positive tuberculin reactions in the vaccinated children than in the unvaccinated. He has noticed no ill effects from the vaccination.

THE AUTHORS' STUDY ON THE BIOLOGICAL CHARACTERISTICS OF B.C.G. CULTURAL CHARACTERISTICS

Our study was based on cultures obtained from three different sources, one from Dr. Watson of Ottawa, Canada, another brought to us by Dr. Lawrason Brown from the Pasteur Institute, and the third was sent direct to us by Prof. Calmette.

The organism grows well on glycerinated bile potato medium. The single colonies are perfectly round and considerably moist. The growth appears from 15 days on, gradually increasing in size. In time the

glistening surface dries out, assuming a mat appearance. They are very easily emulsified and the suspension obtained is very similar to that obtained from the avian tubercle bacillus. The organism grows well on the surface of practically all fluid media used for the cultivation of the tubercle bacillus. Sauton's medium, recommended by Calmette, is very suitable for obtaining a large amount of growth. The filtrate after the 3rd week develops very strong tuberculin. Guinea pigs inoculated with the organisms develop skin hypersensitiveness in about 15 days.

The first culture studied was that obtained from Dr. Watson. Eight guinea pigs were inoculated subcutaneously, the amount varying from 2 to 16 mg. Two guinea pigs received 2 mg.; 2, 4mg.; 2, 8 mg.; and 2, 16 mg. Sixty-one days after the inoculation 1 animal from each group was killed and tuberculosis of the viscera was present. The other 4 animals were allowed to live. Five months from the beginning of the experiment, 1 of the animals which was inoculated with 4 mg. died and the cause of death was recorded as generalized tuberculosis. In the 6th month the animal receiving 16 mg. also died from generalized tuberculosis. At the 7th month the 2 remaining animals, i.e., 1 receiving 2 mg. and 1, 8 mg., were killed. At autopsy no evidence of tuberculosis could be found. At that time we could not explain the discrepancy observed in these animals, 2 having died from tuberculosis, while the other 2 living 7 months were free from tuberculosis. The experiment was suspended for a short time until we obtained another culture.

With the second culture an attempt was made to increase the virulence by rapid animal passage. The technic consisted in inoculating from 1 to 2½ mg. into the right testicle of 2 guinea pigs. After 7 to 14 days the infected testicles were removed aseptically under anaesthesia. The tissues were triturated and reinoculated into the right testicle of 2 other animals. Four such series were done. Three gave negative results after the 3rd, 4th and 5th passages. There was only localized tuberculosis which eventually healed. In one series, however, on killing the animal of the second passage, there was generalized tuberculosis of the viscera, and the spleen was large and nodular. The lymph nodes were very caseous. This caseous material was inoculated in the other guinea pigs and invariably generalized tuberculosis developed and death occurred.

During the cultivation of B.C.G. on fluid media a difference in the character of the growths appeared in some of the flasks. Some were veil-like with small islands of dense growth scattered throughout, while in others the growth was heavy and of uniform structure. This imme-

diately suggested to us the possibility of variants similar to those observed in the reproduction of other acid-fast organisms, and if B.C.G. could be dissociated, at least we could explain some of the discrepancies observed in animal inoculations.

A small amount of the third culture received directly from Calmette was triturated in salt solution with a pH of 7.8, filtered through two layers of Whatman paper No. 5 and 5 drops of the filtrate smeared over the surface of gentian-violet plates. After 6 weeks there appeared two distinct types of colonies. One, which predominated, was waxy, with smooth wrinkles, the folds of which extended from the center to the periphery. The outline was clear-cut, round, raised, and did not extend into the medium. This colony was very difficult to emulsify in salt solution of pH 7.2. We shall call this the "R" colony. The other colony, which we shall refer to as "S," was small, in irregular wrinkles on the surface and was not as smooth and waxy as the "R" colony. The outline was irregular and at times extended into the medium. This colony was much more readily emulsified.

On synthetic fluid media the "R" colony grows in the form of small islands or peninsulas and the growth is readily broken up and lifted with the loop. On the same media the "S" colony grows more tenaciously and in a solid mass very much like a thin veil. In attempting to remove a small amount of the surface growth, practically the whole surface is lifted. Both of these colonies produce tuberculin. Inoculated into guinea pigs, both set up a hypersensitive state to tuberculin. The complement fixing and precipitin antibodies can be demonstrated in rabbits following intravenous inoculations.

A comprehensive study of the biology of the "R" and "S" colonies, with special reference to virulence and immunity, will appear in the near future. All the work so far points out that the two colonies dissociated from the original Calmette strain behave differently, not only in regard to cultural characteristics, but also in virulence for guinea pigs and rabbits. The "R" colony always produces some tubercles which in time heal, while the "S" colony invariably produces progressive disease terminating in the death of the guinea pig. The chemistry of the two colonies is also different.

IMMUNITY EXPERIMENT

The value of B.C.G. vaccination was tried in a limited number of animals and the experiment is not yet completed. The experiment consisted of 38 vaccinated and 26 control guinea pigs. They were divided into four groups.

Group I consisted of 8 very young guinea pigs not older than 36

hours. They were fed with an emulsion of B.C.G. bacillus, four doses of 0.8 mg. being given, a total amount of 3.2 mg. dry weight or approximately 20 mg. moist weight as used by the French investigators. Four and one-half months later 3 drops of a suspension of living virulent culture consisting of 100,000,000 organisms per c.c. were instilled in the eye. Seven controls were infected by the same method. Eight months after the instillation with living tubercle bacilli, in the vaccinated animals, 3 are still living and 5 have died between the 130th and 231st days. Three unquestionably died of tuberculosis. One died from pneumonia complicated with tuberculosis, and in the other which died from a chronic otitis the cervical lymph nodes were enlarged and contained acid-fast organisms. Of the control animals 5 are living and 2 have died. Death in 1 of the animals was due to tuberculosis and in the other to chronic otitis with some tuberculous involvement.

The second group consisted of 8 sensitized animals and 9 controls. In this group also very young guinea pigs not older than 36 hours were used. They were inoculated subcutaneously with a suspension of B.C.G. of 0.25 mg. every 5th day. Four doses were given, a total amount of 1 mg. dry weight or 8 mg. moist weight. The vaccinated and the control animals were then infected by the inhalation method with H 37. At the end of the 8th month, 1 of the vaccinated animals is living and 7 are dead. Four died of extensive tuberculosis, 1 of cellulitis with some tubercular lesions and in 1 the cause of death was undetermined but there were tubercle bacilli at the site of inoculation. The 7th animal died of postpartum peritonitis with considerable amount of tuberculous involvement. Six control animals died of generalized tuberculosis.

The third group consisted of 10 full grown guinea pigs. Four inoculations were made subcutaneously from 2 to 3 days apart. A total amount of 12 mg. of moist weight of the organisms was given. The infecting dose was given subcutaneously a month later, consisting of 500 organisms of H 37. One year later 3 of the animals are still living and 7 are dead. Five which lived more than 279 days died of generalized tuberculosis. One living 98 days died with chronic sinusitis with no macroscopic evidence of tuberculosis. In another animal which also died with sinusitis on the 102nd day there was tuberculosis in the spleen and lymph nodes.

The fourth group consisted of 12 adult guinea pigs. Vaccinations were made intraperitoneally and four doses were given between 2 and 3 days interval, or a total amount of 12 mg. moist weight. A month later they were inoculated subcutaneously with 500 virulent H 37 organisms. One year later 4 of these 12 animals are still living and 8

have died from various causes. Two died shortly after the inoculation and have been excluded from this group as death occurred too soon after infection. One died on the 79th day from gastroenteritis with no evidence of tuberculosis. Another died on the 95th day with chronic otitis and no tuberculosis. Three others died on the 123rd, 238th and 279th days of generalized tuberculosis. In 1 animal dying on the 264th day the cause of death was due to strangulated gut and tuberculosis was present in the spleen and lymph nodes.

Ten controls were used for Groups III and IV. They were inoculated also with 500 tubercle bacilli of the same origin. A year later 1 is living and 9 are dead. One died on the 97th day with chronic otitis with demonstrable tuberculosis in the spleen, one on the 100th day of peritonitis and no tuberculosis, and 1 on the 251st day of pneumonia with tuberculosis of the spleen. The remaining 6 guinea pigs died of generalized tuberculosis, some living as long as 351 days.

DISCUSSION

In the preceding pages an attempt has been made to bring together some of the outstanding features concerning the method of B.C.G. vaccination. The organism in question was isolated some fifteen years ago or more from a heifer. At the time of isolation it was pathogenic for cattle, rabbits and guinea pigs. By cultivating it in glycerinated ox bile potato during this period, it has almost completely lost its virulence, but has maintained the property of forming localized tubercles, of producing tuberculin, of rendering inoculated animals skin hypersensitive, of producing the formation of specific antibodies and according to the sponsors of producing an immunity against virulent reinfection.

According to the majority of workers, B.C.G. is innocuous for small laboratory animals, lesions once established having a tendency to heal. The experiments of Gerlach,³⁵ Nobel,³⁶ Kraus,³⁶ Selter,³⁷ and others are not, however, in agreement as to the innocuousness of the organism. Some of them have been able to establish progressive disease in guinea pigs, eventually leading to death, and Nobel and Gerlach were able to pass the lesions from animal to animal. Korschun³⁸ has been able to increase the virulence of B.C.G. in animals by treating them first with diphtheria toxin.

In two instances we have been able to demonstrate generalized tuberculosis by direct inoculation and in one other instance tuberculosis was established after the second animal passage. In defending their position Calmette and his collaborators state that any positive tuberculosis in animals when inoculated with B.C.G. is due to a con-

tamination with a virulent tubercle bacillus. Accusing any trained worker of carelessness in contaminating cultures is not a justifiable criticism.

An explanation of these discrepancies reported on the virulence of this organism is offered by the recent work on dissociation which has been observed in the majority of bacterial species.

Recently we^{*} have observed that any culture of tubercle bacillus may contain two types of colonies which can be differentiated by their cultural characteristics and virulence for animals. We have found two types of colonies present in a culture of B.C.G., one "R" colony (rough) * which is non virulent, and the other "S" (smooth) * which is virulent for guinea pigs. The "R" colony grows very well on glycerin bile potato and Sauton's media, while the "S" does not produce any visible growth in bile but grows in Sauton's.[†] The latter, however, does not die in the bile medium. Scrapings made from the surface of the inoculated culture 1 and 2 months after incubation invariably produce progressive tuberculosis in guinea pigs, involving the lymph nodes and the viscera. The lesions are similar to those seen in guinea pigs inoculated with bovine tubercle bacilli. These scrapings will also yield a profuse growth after cultivation on suitable egg media. From the lesions of this "S" colony we believe that B.C.G. has still the ear mark of a bovine organism but lacks the power of producing progressive tuberculous lesions in rabbits. By continuous subculturing on potato bile media, Calmette has gradually eliminated most of the "S" colony, allowing the "R" to predominate. The virulent "S" colony, however, has never been completely eliminated, and although present in very small numbers, under favorable conditions it may increase in number to such an extent that reversibility of virulence may take place. An observation of this nature is not uncommon with any other bacteria. It cannot be thought that the tubercle bacillus is an exception.

The animal experiments submitted as the basis of vaccination with B.C.G. are unsatisfactory. There is, at most, only weak evidence to show that this organism establishes any appreciable degree of protection in small laboratory animals. The only evidence being that some of the vaccinated animals outlived the controls. Selter²⁷ believes that some degree of protection can be established, but this is due to the slight degree of virulence still present in the organism. We are inclined to believe that the protection conferred by B.C.G. is very slight and not greater than that obtained with heat-killed organisms where there

* The nomenclature is arbitrary. They are both rough but have a different structure.

† In a recent paper we have been misquoted by Calmette.²⁸

can be no question of danger. The life cycle of the tubercle bacillus is not completely understood and especially of the B.C.G. We consider its use, at least for the present, should be deferred. After the accumulation of more experimental data we may be brought to modify our position.

We cannot completely ignore the autopsy findings of Tailhens,⁶³ Girod and Debarge⁶⁴ in infants who had been vaccinated, nor the tuberculin reaction observed by Weill-Hallé,⁶⁵ where there was evidence that B.C.G. produces some tuberculous changes in vaccinated infants living in healthy surroundings. The mere fact that 28 per cent of infants vaccinated and living in healthy surroundings reacted to the intracutaneous tuberculin skin test forces us to such a conclusion. It will be interesting to know if any of these infants develop clinical tuberculosis later in life. Of course if such occurrence takes place, there are no means for determining whether the disease is due to B.C.G. or to some exogenous infection.

Further, in regard to the immunity in cattle, the results reported by Guérin, etc., have not been universally accepted by men who have studied this problem in cattle. Watson,⁶⁷ of Ottawa, states that tuberculosis may spread very slowly in one herd and again very rapidly in others and he believes the resistance existing in the former is due to the persistence of the tubercle bacillus in the animal body for many years, causing no clinical disease under normal conditions. If, however, some of the infected but not ill animals were put in with a stock free from tuberculosis, they may infect fatally many cattle of the second herd, the original infected lot outliving the second lot. This author also believes that very little could be gained by vaccinating calves, and even if the vaccinated animals were more resistant to superinfection than the unvaccinated, the former could not completely resist an implantation of a virulent organism. After such implantation takes place, the organism in all probability will be localized in the lymph nodes and remain there for a long time doing no damage, but after years of strenuous milk production the animal's resistance may diminish to a point where disease begins to develop.

Calmette's original cattle experiments in 1913⁶⁸ are also open to criticism. He only uses 1 control in each group with 7 or 8 vaccinated animals. The statement is made that 3 mg. of the Vallée bovine strain invariably killed the control in 5 weeks of generalized tuberculosis, while the vaccinated continued in good health. Watson, however, using the same Vallée strain observed that some control calves which had been inoculated intravenously with 250 mg. of the organism and killed 11 months later showed only lymphatic tuberculosis. Did Calmette

use identical suspensions in his control in each experiment; or did he assume from previous experiments that the Vallée strain always killed in this dose? We now know that unless we cultivate our human H 37 and bovine B 1 tubercle bacilli on suitable media the virulence diminishes. For this reason when testing the resistance of vaccinated animals the same number of controls must always be used.

Uhlenhuth⁴⁰ is inclined to believe that the cattle experiments reported by Calmette where infection was by contact were not carried out as they should have been. The heads of the animals were turned toward the wall, thus preventing the droplet infection. At least the certainty of natural infection was lessened.

We suggest that the success reported by Guérin in cattle experiments was not due to the protection established by vaccination with B.C.G., but to the elimination of the contaminators on the one hand, and to the development of natural resistance on the other. This point seems obvious in the animals killed 7 years after they have reacted positively to tuberculin, the autopsies revealing only few small lesions.

The favorable reports coming from Europe on the vaccination of new-born babies are so amplified that they have reached the point of distortion. Careful analysis of the statistics submitted reveal one outstanding fault, viz., that not a single group of vaccinations has been controlled. We have failed so far to find comparable figures which may lead us to some conclusion. Mortality rates from tuberculosis in infants, in one instance, are quoted as far back as 1889. Have not the conditions and our knowledge of sociological measures been improved in recent years so as to bring the mortality to a lower level? Calmette claims that in France he has reduced the mortality from tuberculosis in the first year of life from 25 per cent before the vaccination to 0.9 per cent after the vaccination. Does this 25 per cent mortality in infants in tuberculous families refer to the group of known infected as detected by the positive tuberculin reaction, or does it represent a percentage from the general mortality? It is not quite clear in our minds.

It must be remembered that most of the vaccinated children born of tuberculous mothers were removed from contact for at least 4 months, thus decreasing the possibility of an infection in this early period of life. This isolation gives the infants an opportunity to adjust the normal mechanism of defense against any infection. No infants in France without vaccination have been submitted to a similar preventive measure early in life. How then can we compare the two groups, the vaccinated and the unvaccinated? Two factors are involved in these studies, vaccination and hygienic preventive measure.

Further, how can we determine the cause of death in infants from tuberculosis without post-mortem examination? There are other forms of tuberculosis in infants besides tuberculous meningitis which are not easily diagnosed. Calmette presents only 3 autopsies, involving a study of several hundred deaths. Many of the vaccinated infants have died of gastroenteritis; in fact, over 30 per cent of the deaths occurring in the vaccinated infants not due to tuberculosis have been recorded as gastroenteritis. Could it not be possible that in some this gastroenteritis was of a tuberculous nature? While it is probable that the organism, by feeding, may find its way into the mesenteric lymph nodes and then be distributed throughout the body, it is conceivable that when such large doses are administered at birth the mucosa may become involved directly. The innocuousness of the organism has been based on the observation that no fatalities have been reported after oral vaccination. Fortunately, contrary to Calmette, the experimental evidence is against any great danger of infection taking place by this route. Findel,⁶⁶ Reichenbach,⁶⁷ Selter,⁶⁸ Brown, Petroff and Pesquera⁶⁹ could not readily infect guinea pigs by feeding. The only misgiving we have is that some virulent type (S) may be carried along with the non-virulent.

Weill-Hallé observed only 2 per cent positive tuberculin reactions up to 3 months in a group of infants vaccinated by the oral route and living in healthy surroundings. When the vaccine was administered subcutaneously 100 per cent of the infants reacted intracutaneously to tuberculin. Is this not sufficient proof that very few of the organisms pass through the intestines of the infants?

In explaining the 0.9 per cent mortality from tuberculosis in infants vaccinated with B.C.G., Calmette⁷³ and Surrez⁷⁰ do not, as a rule, attribute it to an infection of exogenous character subsequent to vaccination. They profess to believe that tuberculosis occurred in these infants usually as a result of fetal infection with the ultra-microscopic filtrable form of the tubercle bacillus which traversed the placenta, a theory which is still a speculation. In our laboratory we have not yet confirmed the existence of a Berkefeld filtrable form of the tubercle bacillus.

We are further told not to worry about the B.C.G. because it is a bovine organism which is not virulent for human beings; but is it not a false security to depend upon its presence for protection without any knowledge of what immunity, if any, it confers? Infection with the bovine tubercle bacillus in infancy is today a rare occurrence; but what becomes of this organism after puberty in those that have been infected? Does the bovine organism transmute into the human

tubercle bacillus after inhabiting the body for a long time? All evidence up to the present is against such transmutation, but we must not be too dogmatic in completely ignoring its possibility.

The differentiation of the human and bovine cultures has been based on the ability of the organism to produce progressive disease in a rabbit. If a culture inoculated in dosage of 0.01 mg. infected the rabbit and death followed in 60 days, then the organism was bovine, and if it did not, it was human. This holds true probably with the two extreme types; but how about the intermediate ones? If B.C.G. was a bovine tubercle bacillus at the time of isolation, it must possess all conventional biological characteristics, i.e., it must be virulent for rabbits, cattle and guinea pigs and give the alkaline curve on broth as described by Theobald Smith. The dissociated "S" virulent colony of this organism infects only guinea pigs at present with a marked lymphatic involvement comparable to many other bovine tubercle bacilli, is no longer pathogenic in small dosage for rabbits, and the acid base curve is that seen in the human organism. In other words, the organism has some human and some bovine characteristics. Mudd¹¹ also points out that B.C.G. behaves like the human strains studied in his interfacial experiments.

The main object of the present campaign in prophylactic immunization has been to reduce the mortality from tuberculosis during the first year of life. Vaccination with living organisms has been suggested and very extensively used. There is evidence that the general mortality has been reduced and there are indications that some of the infants have been infected, while others, regardless of the prophylactic measures and vaccination, have been reinfected with small numbers of virulent organisms.

It seems advisable and a much safer procedure not to introduce another living organism into the body but rather, by hygienic measures, to eliminate as much as possible the danger of excessive infection from the new-born babies. Such preventive measures are effective, as was pointed out by Grancher some twenty-five years ago, and more recently, Debré and Lelong¹² and others have been able to prevent infection in infants by removing them from their tuberculous mothers. König,¹³ studying the mortality in Prussia, states that in 1925 the general mortality among 246,488 infants under sanitary supervision was reduced from 12 to 5.5 per cent. Among them there were 188 male infants living in tuberculous surroundings of whom only 6.3 per cent reacted positively to tuberculin and 140 females of whom only 5.7 per cent reacted. These remarkable figures have been obtained not by B.C.G. vaccination but by educational and preventive measures.

In the United States and Canada where the campaign against tuberculosis is made very effective by the use of various sociological and health measures, mortality and infection in childhood have decreased to a very low level and we cannot see why such a prophylactic measure as advocated by the French investigators should be introduced at present. We may recall that Friedmann's vaccine which was condemned in 1912 was also a living organism, and the potential virulence of it was probably of lower degree than B.C.G. We believe that watchful waiting is the best position at present in reference to vaccination of infants. We cannot completely ignore the possibility of a prophylactic vaccination method and the one advocated demands our careful consideration. The careless use of poor statistics obtained from a study of human beings is going to lead us nowhere.* Therefore, we strongly advocate experiments in cattle on a large scale in order to confirm or refute Calmette's claims.

* The reader is referred to a comprehensive analysis of Professor Calmette's statistics by Dr M. Greenwood in the *British Medical Journal* of May 12, 1928

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Institute for the Protection of Child Health in Soviet Russia

BY government decree there was recently established in Moscow the Government Scientific Institute for the Care of Child Health. The institute, which is doing theoretical as well as practical work, has the following purposes:

- 1 Study of the physical and psychological nature of normal and abnormal children between the ages of 4 and 17 years
- 2 Study of methods for the prevention and treatment of physical and mental disorders in children of these ages
- 3 Training of workers for the care of the health of children and young people

The institute consists of the following four divisions: division of the normal child, division of the physically abnormal child, division of mental and nervous disorders, and the statistical division. A separate section will be devoted to the training of physicians as specialists in child health work.

The following auxiliary agencies are connected with the institute: an experimental dietetic dining room; a clinic for normal children, one for physically defective and one for mentally defective children; a sanatorium, a playground conducted on the principles of physical therapy; a diagnostic clinic, and a museum. The institute is cooperating with other organizations interested in child health.—*Voprosi Zdravoo Khranenia*, Moscow, 1 74, 1928, 4: 81. 1928.



Refugees gathered at Santa Paula immediately after the flood, lined up for typhoid immunization

Sanitation in the St. Francis Dam Disaster*

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THE St. Francis dam in San Francisquito Canyon of Los Angeles County, impounding more than 12 billion gallons of water, broke about midnight of March 13, 1928. This dam, of concrete construction, had a maximum height of 205 feet, was 700 feet long, and was 175 feet thick at the base. It failed completely, with the exception of a small section near its middle, and the force of the flood water was so great that it broke the structure into great blocks of concrete up to about 10,000 tons in weight, distributing them for a distance of several thousand feet down stream. The flood waters attained a maximum depth of about 125 feet, and traveled, in a solid wall, down San Francisquito Canyon at the rate of 18 miles an hour. The flood followed this steep and narrow gorge for its length of 9 miles from the dam and then down the Santa Clara River 43½ miles to the ocean. It required about 5 hours for the enormous rush of water to travel the 52 miles from the dam to the Pacific Ocean. The Santa Clara River, like so many western streams, is practically an arroyo, containing water only intermittently during the rainy winter seasons. Practically the entire flow of this river is storm water and it is only during periods of heavy rains that it carries any stream whatsoever. It has a well defined channel, however, and the direction of the flood was determined to a certain degree by the topography of the dry bed. This immense volume of water, travelling at a terrific rate of speed, was hurtled from one



This huge block of concrete, 205 feet in height, the central section of the dam, was all that remained standing.

side of the Santa Clara River bed to the other, spreading out where the stream bed was flattened, piling up at its narrow confines, becoming dammed momentarily at bridges where debris had caught, and eventually carrying out all bridges, with the exception of one located not far from the Pacific Ocean.

The dry character of the stream bed and the comparatively short distance traveled by the flood, and its high rate of speed rendered the problems of sanitation far less acute than would have been the case with a flowing stream and a slow rising flood. The fact that there were no levees to break and that comparatively few towns or ranches were located immediately adjacent to the stream bed, made relief work and sanitation associated with the disaster far less arduous than in flood disasters in other parts of the country.

The town of Santa Paula, with a population of 7500, was the largest town involved. Santa Paula and Saticoy were the only towns in the flood which had municipal water supplies and sewage disposal plants. Most of the damage to property was done in Santa Paula and its vicinity. About 300 bodies were recovered, most of which were buried in debris. There are at least 200 missing, all of which are probably covered with many feet of silt. The bodies of individuals who were caught in the flood immediately below the dam were carried like corks on the crest of the flood, and many were recovered on the lower reaches of the Santa Clara River and even on the beach at the Pacific Ocean. Bodies of individuals who were caught in the flood waters farther down stream lodged in tangled masses of brush, trees and other debris caught in groves of willow trees at the banks of the stream.

As soon as word of the disaster was received, representatives of the California State Department of Public Health left Los Angeles and San Francisco simultaneously. The first order issued by these officials upon their arrival in the flood area was that all milk supplies in the entire valley must be pasteurized. Immediately thereafter a regularly organized program was instituted and enforced through the coöperation of the local health officers, physicians, nurses, Red Cross workers, city and county officials, representatives of the Bureau of Light and Power of the City of Los Angeles, and a citizens committee of Santa Paula. The staff of the State Department of Public Health within the flooded area consisted of 2 epidemiologists, 1 district health officer, 1 physician specialist in child hygiene, 3 sanitary engineers, 4 sanitary inspectors and 2 public health nurses. The four main activities carried on by this staff were:

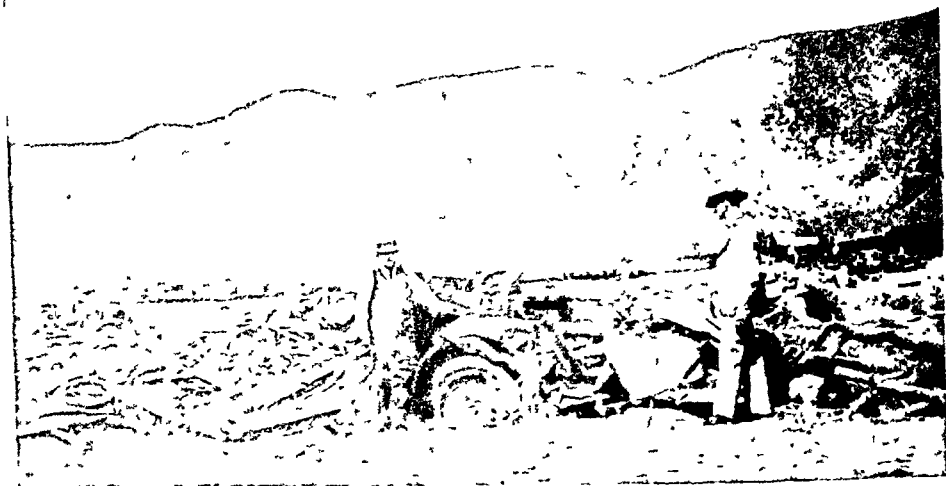
1. Safeguarding water supplies and sewage disposal plants
2. Safeguarding milk supplies
3. Offering immunization against typhoid fever to all individuals within the flooded area
4. Sanitary inspection of towns, ranches and the silt covered river bed

The Safeguarding of Water Supplies and Sewage Disposal Plants

The municipal sewage disposal systems at Santa Paula and Saticoy were washed over and it became necessary to provide emergency chlorination of the Santa Paula municipal septic tank effluent because of the impairment to the efficiency of the plant. Flood water entered the municipal water reservoir at Saticoy, making necessary the immediate disinfection of the water contained therein. Private and irrigation wells along the fringe of the flood, about 100 in number, located both above and below the Santa Paula sewer farm, were inspected and examined bacteriologically for contamination. Field equipment from the Los



Another view of the central section of the dam



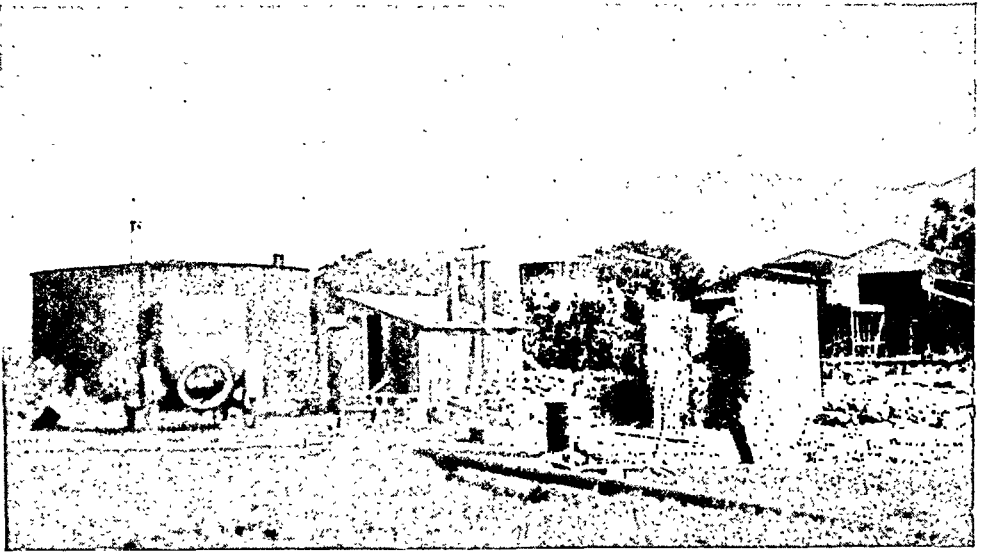
Automobiles and wreckage partly buried in silt

Angeles city water department laboratory made possible the making of analyses in the field, speeding up this work immeasurably.

Safeguarding of Milk Supplies—Following the order, which provided for the immediate pasteurization of all milk supplies, the inspection and safeguarding of all such supplies were placed under the direction of the County Sanitation and Milk Inspector. No milk, other than pasteurized milk, was permitted to be used in any of the refugee camps which were in charge of local committees. Following the establishment of the safety of all water and milk supplies at dairies and the establishment of sanitation conditions, the distribution of milk under normal conditions was resumed.

Immunization against Typhoid Fever—Immunization against typhoid fever was offered to the inhabitants of the entire Santa Clara Valley. The representatives of the State Department of Public Health, in coöperation with local health officers, physicians and nurses, established clinics in the various communities: Santa Paula, Fillmore, Piru, Bardsdale and Saticoy, as well as other more isolated communities. A total of 3106 individuals in the flooded district were immunized against typhoid fever. Of these, 1080 were immunized by representatives of the State Department of Public Health, and 2026 were immunized by local health workers at Santa Paula. The state provided the vaccine for all immunizations. On March 23, first injections at immunization clinics were discontinued.

Sanitary Inspections—The work of the state sanitary inspectors, consisted of the cleaning of dairies, the inspection of homes rehabilitated following the recession of flood waters, the inspection of quarters



Temporary fly-tight toilets installed in the refugee camp at Santa Paula

provided for refugees and all labor camps, the proper disposal of carcasses of dead animals, the disinfection of open cesspools and vault toilets, the burning of debris, the inspection of vegetable truck gardens and similar activities.

RELIEF MEASURES

General relief measures were carried on under the direction of the Red Cross, the American Legion and other local organizations. Within a few hours after the recession of the flood waters provisions were made for housing homeless Mexicans in Santa Paula, of which there were between 300 and 400. Clothing was provided and breakfast was served to 168 families at 7 o'clock on the morning of the day of the flood. Hospitalization was provided for the relatively small number who needed such care. A tent city was established for the habitation of those rendered homeless on account of the flood. This community was constructed along sanitary lines and provided adequate temporary accommodations for the homeless. About 400 houses in Santa Paula, located in an area which comprised from 10 to 15 city blocks, were destroyed or so badly damaged that rebuilding was necessary.

As soon as the emergency conditions abated, the City of Los Angeles, which assumed full responsibility for the disaster, dispatched between 2,000 and 3,000 men to clean up, in military fashion, the entire Santa Clara River bed. Tractors and trucks were used to remove debris, in which were found automobiles, human bodies, dead horses and other animals. Most of the debris was moved to safe distances and burned. Arrangements were made by which all crews

working in the river bed were provided with portable toilets. Isolation tents were provided at all labor and refugee camps in order to provide temporary hospitalization facilities for those who became sick or were injured.

In order to coöperate more closely with the health officials, the Los Angeles Bureau of Light and Power appointed local physicians to care for the sick, and the contracting company which carried on this work appointed a sanitary inspector to visit and supervise sanitary conditions in all camps within the flooded area. The district affected by the flood lay entirely within Ventura County, excepting the upper part of the district, the sanitation of which was cared for in an able manner by the Los Angeles County Health Department.

The emergency in the St. Francis dam disaster and the flooding of the Santa Clara river bed constituted an acute emergency. The disaster was characterized by the comparatively high mortality and the short duration of disaster conditions. The work of sanitation was, as a result, completed quickly and a return to normal conditions was effected within a short time. Had the population in the Santa Clara River watershed been larger the loss of life would have been enormous, as there was little time for warning and small chance for escape. No cases of communicable diseases occurred as a result of flooded conditions. The excellent coöperation of local authorities and the City of Los Angeles, as well as that provided by citizens' committees, the American Red Cross, the American Legion, and others, aided materially in the prevention of the occurrence of communicable diseases and brought about the speedy return to normal conditions.



Stream bed of the Santa Clara River after the flood waters had passed. Many bodies of the dead were recovered in the debris which piled up against the willow trees shown in the background.

The Preventorium School

A Factor in the Community Tuberculosis Program

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and

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THE Berkeley Sunshine School is an adaptation to the public school system of the preventorium régime. Its plan was inspired by a study of the following:

1. The inadequacies of the so-called open air school
2. The satisfactoriness of the Lymanhurst School of Minneapolis¹
3. The need for preventorium régime of a larger number of children than were being reached
4. The necessity of modifying the school curriculum for the benefit of certain children with organic defects
5. The large number of school days lost by children who were convalescent from acute illness

This school has now been in successful operation in Berkeley for a year and a half. Results being obtained are therefore of interest.

Berkeley, with a school population of 15,000, was found to have continuously in the elementary schools between 100 and 150 children who were in need of preventorium régime, and another 25 to 50 who were in need of curriculum modification because of organic defect or prolonged convalescence from acute illness. Berkeley's quota of beds at the county preventorium was but 8, less than 5 per cent of the number needing this care. Admission to the preventorium was further restricted by limiting such admissions to persons unable to pay a private physician. The preventorium turnover of cases was very slow. Some children became sanatorium candidates before their turn came for preventorium admission. A study of 40 children discharged from the preventorium or sanatorium for 6 months or more showed the following conditions:

Readmitted to sanatorium or preventorium	9
On waiting list for readmission	10
Failing to improve	17
Showing steady improvement	4
Total	40

Further study of the 36 who failed to show steady improvement disclosed the fact that all were being subjected to greater physical strain than they could stand, and they were not receiving sufficient rest.

The Sunshine School was organized to care for children in the following groups:

Convalescents from acute illness

Children with or without known tuberculous infection in danger of developing tuberculous disease

Cardiacs needing increased rest, limited activity, and careful supervision of exercise

Children with other organic defects who would be benefitted by a rest régime

Children discharged from the preventorium or sanatorium who were still in need of increased rest and close medical supervision

For purposes of economy the school was housed in an elementary school building and made an administrative unit of that school. The capacity was limited to 40 children for the first year, and then expanded to 60 children. Space required is two dormitories, (converted classrooms), school cafeteria, (used by entire school), three classrooms, shower and dressing rooms, and a sun platform erected on the school grounds. The project was financed by the Berkeley Board of Education, the Berkeley Health Center, the Alameda County Tuberculosis Association, California Tuberculosis Association, Berkeley Exchange Club, and the Berkeley School Lunch Committee.

The total budget of the Sunshine School for the first year, covering cost of 40 children, is shown in Table I. This budget does not include any part of the overhead of the elementary school in which the Sunshine School is housed.

The maintenance cost per pupil-day at the Sunshine School, based upon figures for the year 1926-27, was 80 cents. This is 17 cents per day in excess of the cost per pupil-day in the regular elementary school in which it was housed. The saving over the per diem cost at any preventorium is apparent.

TABLE I
FIRST YEAR BUDGET OF SUNSHINE SCHOOL

Item	Source of Income		Total Amount
	Board of Education	Coöperating Agencies	
Original Equipment	\$1,682.00	\$1,496.95	\$3,178.95
Maintenance	3,706.50	2,332.84	6,039.34
Total	\$5,388.50	\$3,829.79	\$9,218.29

Staff of Health Workers—In addition to the usual school staff, the following persons carry out the health program under supervision of the Director of Health Education for the Berkeley Schools, who also holds the position of City Health Officer, and Medical Director of the Berkeley Health Center:

School Physician—The school physician is in charge of admissions, medical supervision and follow-up. He is also chief of pediatrics and

conducts the Sunshine School admission clinic at the health center.

Adviser in Tuberculosis—This worker also holds the position of superintendent of social service for the health center. She represents the medical director in health administration of the school.

Teachers—There are 3 teachers, who in addition to their teaching, supervise rest periods, and the lunch hour.

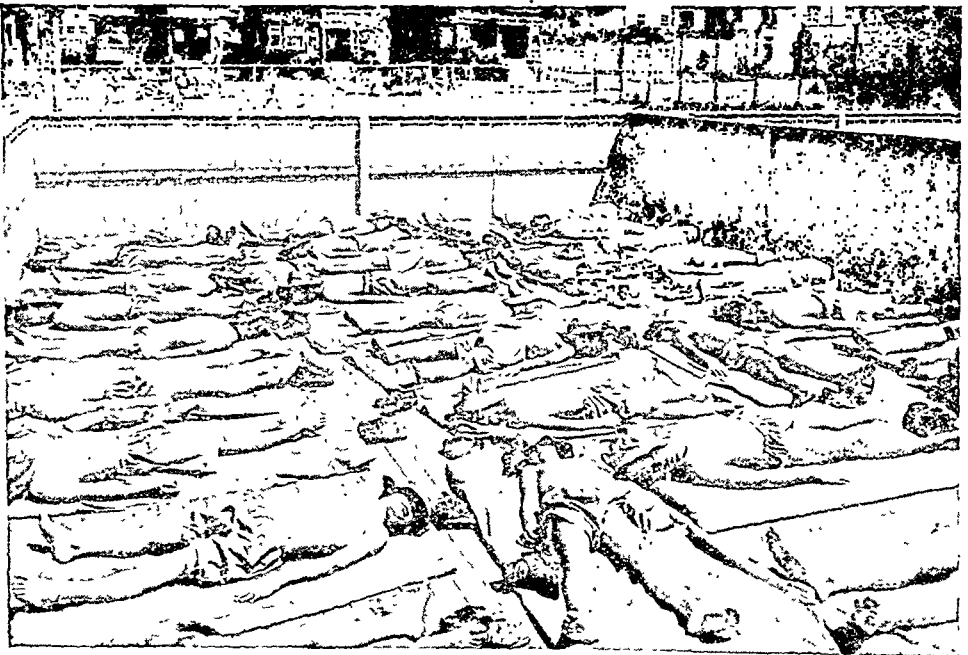
School Nurse—The school nurse is on duty at the school half time. She takes charge of sun and air treatments, and general health supervision under direction of the school physician. She also correlates the Sunshine School with the public health nursing staff of the city.

School Dietitian—She is in charge of the school cafeteria, and plans the menus.

Requirements for admission specify that applicants must be Berkeley residents, from the first 6 grades. Their financial status does not determine eligibility, this being determined by physical need.

They must be examined in the health center pediatrics department, where each case is worked up medically. Each child must be rendered free from any condition which will prevent improvement in the Sunshine School, and treatment is arranged through the family physician or in health center clinics.

In addition to medical findings, the health center social service department reports on home conditions, and determines the ability and willingness of the family to carry out the school program in the home.



Sun Treatment

Case work is done if there are social conditions which interfere with the patient's physical improvement.

The amount of school work is limited to 3 hours daily—time enough to cover only the essentials. This amount of time has enabled practically all children to keep up with their school grade.

School hours are from 8:45 a. m. to 4:00 p. m., and lunches must be eaten in the cafeteria under supervision. The following schedule is used:

8:45	Temperatures taken and inspection made by nurse for communicable diseases
9:00-10:00	School
10:00-11:00	Sun or air exposure
11:00-12:00	Rest hour
12:00	Temperatures taken
12:45- 1:00	Lunch
1:00- 2:00	Rest hour
2:00- 4:00	School

A mid-afternoon lunch of crackers and milk is served before the children go home.

Children are weighed once a week, and a complete record of weights, temperatures, sun exposure, and other medical data, is kept by the nurse, and is gone over each week by the school physician.

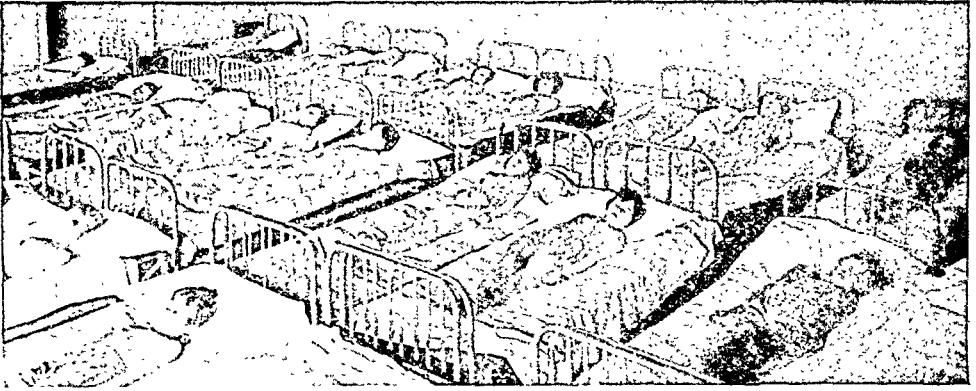
Further details of the medical régime have been described by Potter.³

RESULTS OBSERVED

Table II shows medical needs were met in 62 out of 79 children, or 73 per cent. This table also shows complete success to date with the group of ex-sanatorium and ex-preventorium children. For the entire group of convalescent, malnourished and tuberculosis observation cases, totalling 48, the Sunshine School régime was successful with 33, or approximately 70 per cent. In these percentages the number of

TABLE II
MEDICAL OUTCOME AFTER 3 SEMESTERS

Medical Problems	Improved sufficiently to be transferred to regular school	Improved but remaining in Sunshine School	Unimproved but remaining in Sunshine School	Unimproved and transferred to an institution	Discharged for poor coöperation	Total
Convalescent or malnourished	5	6	0	2	1	14
Tuberculosis observation cases	11	11	2	6	4	34
Cardiacs	0	3	0	1	1	5
Asthmatics	1	4	0	0	0	5
Ex-sanatorium or ex-preventorium children	12	9	0	0	0	21
Total	29	33	2	9	6	79

*Rest Hour*

children discharged for poor coöperation are considered treatment failures for the reason that coöperation might have been obtainable if the children had been removed from the home to a preventorium.

There is a marked reduction in the number on the preventorium waiting list. This has been reduced from 60 to less than 10.

An increased turnover is shown at the preventorium. Many children are discharged from the preventorium to the Sunshine School with satisfactory results.

There is a continued gain in children discharged from the preventorium, whereas, previously, many of these children showed retrogression.

A more effective means of health education of parents is available than would be possible if the child were removed from the home.

A greatly increased interest is shown in child hygiene and school health work by the community at large. This type of health activity very easily sells itself to the community because of its tangibility. In spite of early difficulties in financing this institution, it is now safe to say that a number of agencies would volunteer support for its continuance if necessary.

CONCLUSIONS

1. A school of this kind carefully operated along sound health, social and educational lines is a necessary adjunct to the tuberculosis program of a community.
2. Such a school is one solution for the economic difficulty of providing adequate preventorium space in the average community.
3. This type of school is superior to the so-called open air school because:
 - a. Health work is more intensive.
 - b. Rest receives more emphasis.
 - c. Sun and air exposure are made part of the program.
 - d. It calls for a complete break from the child's past routine which tends to impress both child and parents and thereby obtain better coöperation.
4. Such schools will not replace the preventorium, but are best regarded as an

auxiliary to the preventorium and sanatorium, as well as to the school health program. If future experience bears out our observation that 73 per cent of these children can be cared for without subjecting the community to the expense of putting them in a preventorium, then it is felt that such a plan is justified. On the other hand, some provision must still be made for the 27 per cent who are not improved by the preventorium school.

5. Such a school should be centralized in one building rather than generalized in a preventorium room in each of several schools because:

a. The plan will usually need financial support in addition to what the Board of Education can supply. This is much more easily obtained by operating a centralized plant which can be visited and described with ease.

b. A centralized school removes the possibility of stigmatizing children who would otherwise be segregated for health reasons in a regular school.

c. Curriculum modifications are so drastic that success depends upon a high degree of cooperation from the school principal. Such coöperation is much easier to obtain from one school principal and his teaching staff than from 15 or 20.

d. This school requires a decided change in the child's routine which impresses parents and assures better coöperation from the home.

e. Coordination of health centers, preventoria and sanatoria, and school health program is easier to attain through one such school than for numerous schools.

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Mid-morning Nourishment

What Will Probably Cause Your Death?

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HAVING reached any given age, what is the probability that a person will die of cancer? the probability that he will die of heart disease, etc.? These are questions of real interest to every woman and man.

In the tables given, at specified ages, the per cent probabilities of dying eventually of certain specified causes of death.

Epidemic or Endemic Diseases—The probability of a white male dying of such a cause ranges from 4.9 per cent at birth to 2.5 at ages 50 to 60 years, and is 3.0 per cent at age 90. The corresponding probabilities for white females are fractionally higher throughout life but still closely parallel the male probabilities, ranging from 5.3 at birth to 3.0 at ages 50 to 60 years and to 3.3 at age 90.

For the colored, the percentages range from 7.2 for colored females at birth to 3.9 for colored males aged 50, 60 and 90 years.

Tuberculosis—For white males at birth, the probability figure is 6 per cent and the highest probability of dying of this disease (6.7 per cent) appears at age 15, after which there is a continuous decline until at age 90 the figure is 0.2 per cent; for white females at birth the figure is 5.7 and the highest probability is at ages 1 to 15 (6.1 per cent), followed by a continuous decline to 0.2 per cent at age 90.

For colored males, the figure at birth is 11.4 and the highest probability, 13.0, appears for children 5 and 10, after which the trend is downward to 0.7 per cent at age 90, the probability figures at each age, however, always being much higher than those for white males of the same age; for colored females at birth the figure is 12.3 and the highest probability, 13.8, is for children aged 5 years after which there is a downward trend to 0.5 per cent at age 90, the probability figures at each age being much higher than for white females of the same age.

Cancer—For white males at birth the figure is 7.6 and the highest probability is at age 50 (10.1 per cent). After that age the figures steadily decline to 3.4 per cent at age 90; for white females at birth the figure is 10.6 and the highest probability figure is at age 40 (13.1 per cent) after which the trend is downward to 3.8 per cent at age 90.

For colored males the figure at birth is 2.5 and the highest proba-

TABLE I
PROBABLE CAUSE OF DEATH

OF 100 WHITE MALES REACHING THE AGE OF 40 YEARS		OF 100 COLORED MALES REACHING THE AGE OF 40 YEARS	
Number	Eventual Cause of Death	Number	Eventual Cause of Death
23	Heart disease	20	Heart disease
12	Nephritis	16	Nephritis
12	Cerebral hemorrhage	9	Cerebral hemorrhage
10	Cancer	7	Tuberculosis
7	Pneumonia	7	Pneumonia
7	External violence	5	External violence
4	Tuberculosis	4	Cancer
25	Other causes	32	Other causes
OF 100 WHITE MALES REACHING THE AGE OF 60 YEARS		OF 100 COLORED MALES REACHING THE AGE OF 60 YEARS	
Number	Eventual Cause of Death	Number	Eventual Cause of Death
25	Heart disease	21	Heart disease
14	Cerebral hemorrhage	18	Nephritis
13	Nephritis	10	Cerebral hemorrhage
10	Cancer	7	Old age
6	Pneumonia	6	Pneumonia
5	External violence	4	Cancer
2	Tuberculosis	4	Tuberculosis
25	Other causes	3	External violence
		27	Other causes
OF 100 WHITE FEMALES REACHING THE AGE OF 40 YEARS		OF 100 COLORED FEMALES REACHING THE AGE OF 40 YEARS	
Number	Eventual Cause of Death	Number	Eventual Cause of Death
23	Heart disease	21	Heart disease
14	Cerebral hemorrhage	13	Nephritis
13	Cancer	12	Cerebral hemorrhage
11	Nephritis	8	Cancer
7	Pneumonia	6	Pneumonia
4	External violence	5	Tuberculosis
3	Tuberculosis	2	External violence
25	Other causes	33	Other causes
OF 100 WHITE FEMALES REACHING THE AGE OF 60 YEARS		OF 100 COLORED FEMALES REACHING THE AGE OF 60 YEARS	
Number	Eventual Cause of Death	Number	Eventual Cause of Death
25	Heart disease	21	Heart disease
15	Cerebral hemorrhage	14	Nephritis
11	Nephritis	13	Cerebral hemorrhage
11	Cancer	8	Old age
7	Pneumonia	7	Cancer
4	External violence	6	Pneumonia
2	Tuberculosis	3	Tuberculosis
25	Other causes	2	External violence
		26	Other causes

bility per cent is 4.0 at age 50, and for colored females the figure at birth is 5.4 and the highest probability per cent is 8.0 at age 40.

Diabetes—For white males the figure is 1.4 at birth and 1.6 at ages 40 to 60, after which the trend declines gradually until it reaches 0.4 per cent at age 90; for white females the figure at birth is 2.1, the highest probability figure is 2.6 per cent for age 50 and the lowest figure is 0.3 per cent for age 90.

For colored males the figure at birth is 0.6 per cent, the highest probability figure is 0.8 per cent for ages 40 to 60, and the lowest, 0.3, for age 90; and for colored females the figure at birth is 0.9, the highest probability figure is 1.3 per cent for ages 40 to 50, and the lowest, 0.4, for age 90.

Cerebral Hemorrhage—For white males at birth the per cent figure is 9.1 and the probability of dying of this disease increases to 14.1 at age 70 and then decreases to 10.4 at age 90; for white females the per cent figure is 10.5 at birth followed by a trend upward to 15.4 at age 70 and then a downward trend to 11.5 at age 90.

For colored males the figure is 5.8 at birth, 10 at age 60, and 6.2 at age 90; for colored females the figure is 7.6 at birth, 13.3 at age 60 and 8.6 at age 90.

Heart Disease—For white males at birth the per cent figure is 18.2 and the probability of dying of this disease increases to 25.6 at age 70 and then decreases to 21.5 at age 90; for white females the per cent figure is 18.5 at birth followed by a trend upward to 25.4 at age 70 and then a downward trend to 21.9 at age 90.

For colored males the figure is 13.7 at birth, 20.8 at ages 50 and 60 followed by a decline to 14.5 at age 90; for colored females the figure is 14.2 at birth, 21.3 at age 50 followed by a decline to 14.6 at age 90.

Pneumonia—For white males at birth the probability figure is 7.6, the trend is then downward to 6.2 at age 60 and then upward to 7.1 at age 90; for white females the probability trend starts with 7.5 at birth, declines to 6.7 at ages 5 to 20 and then increases to 7.9 at age 90.

For the colored at birth the figure for males is 9.2 and for females 7.4 and the trend for each sex is downward to 4.7 for males aged 80 and 4.8 for females aged 90.

Nephritis—For white males the figure is 9.1 at birth, 13.1 at age 70 and 11.2 at age 90; for white females, 9.1 at birth, 11.4 at age 60 and 8.4 at age 90; for colored males, 10.3 at birth, 18.0 at age 70 and 13.2 at age 90; for colored females, 9.0 at birth, 13.5 at ages 50 to 60 and 9.2 at age 90.

Automobile Accidents—At birth, the highest probability of dying from this cause (1.5 per cent) appears for white males; at age 2 years this probability has increased to 1.7. From that age the trend is downward until at age 90 it is 0.2 per cent.

Other Forms of External Violence—For white males the figure is 8.0 at birth and 8.7 at age 2. There is then a downward trend until at age 70 the figure is 3.4 and then an upward trend to 4.4 at age 90; for white females the figure is 3.8 at birth and 4.0 at ages 1 and 2; then

TABLE II (cont.)

Per cent Probabilities, at specified ages, of dying eventually of specified causes
(Figures based on life tables 1919-1920, and on deaths 1921-1925 in the 31 registration States of 1920 and the District of Columbia)

Cause of death, color and sex	Per cent probability, at specified age, of dying eventually of specified cause										
	At birth	1 year	2 years	5 years	10 years	15 years	20 years	30 years	40 years	50 years	60 years
Pneumonia (all forms)											
White	7 6	7 1	6 9	6 7	6 7	6 7	6 7	6 7	6 5	6 3	6 2
Females	7 5	7 1	6 8	6 7	6 7	6 7	6 7	6 8	6 5	6 3	6 2
Colored	9 2	8 5	8 0	7 7	7 7	7 7	7 5	7 1	6 5	6 0	5 6
Females	7 4	6 7	6 3	6 0	5 9	5 8	5 8	5 8	5 7	5 7	5 6
Diseases of the digestive system											
White	7 2	6 3	5 9	5 7	5 6	5 5	5 4	5 3	5 1	4 8	4 3
Females	6 9	6 1	5 8	5 6	5 6	5 5	5 4	5 1	4 9	4 5	4 1
Colored	6 8	5 6	5 1	4 9	4 8	4 8	4 7	4 8	4 6	4 3	3 8
Females	6 7	5 7	5 3	5 1	5 0	5 0	5 0	5 0	4 7	4 1	4 0
Nephritis											
White	9 1	9 9	10 1	10 3	10 4	10 5	10 6	11 0	11 6	12 1	12 6
Females	9 1	9 7	9 8	10 0	10 1	10 2	10 3	10 7	11 1	11 3	11 3
Colored	10 3	11 5	11 8	12 1	12 2	12 4	12 9	14 2	15 7	16 9	17 8
Females	9 0	9 8	10 0	10 3	10 4	10 6	11 0	12 1	13 0	13 5	13 5
Puerperal diseases											
White	2 1	2 2	2 3	2 3	2 3	2 3	2 2	1 7	0 2	1	
Females	2 9	3 2	3 3	3 4	3 5	3 5	3 0	1 7	0 1		
Automobile accidents											
White	1 5	1 6	1 7	1 6	1 5	1 4	1 3	1 2	1 0	0 8	0 7
Females	0 6	0 6	0 7	0 6	0 6	0 5	0 5	0 7	0 4	0 4	0 3
Colored	0 8	0 9	0 9	0 8	0 8	0 8	0 8	0 7	0 6	0 5	0 1
Females	0 3	0 3	0 3	0 3	0 3	0 3	0 3	0 2	0 2	0 2	0 2
Other forms of external violence											
White	8 0	8 6	8 7	8 6	8 5	8 1	8 1	7 0	5 9	4 9	4 0
Females	3 8	4 0	4 0	3 9	3 8	3 7	3 7	3 5	3 5	3 1	3 5
Colored	8 3	9 1	9 2	9 2	9 1	8 9	8 3	6 6	4 7	3 6	2 9
Females	3 2	3 4	3 3	3 0	2 8	2 7	2 7	2 3	2 0	2 0	2 1
Old age											
White	1 3	1 5	1 5	1 6	1 6	1 6	1 6	1 7	1 8	2 0	2 1
Females	1 9	2 0	2 0	2 1	2 1	2 1	2 2	2 3	2 5	2 7	3 2
Colored	2 9	3 0	3 1	3 2	3 2	3 3	3 5	3 9	4 1	4 3	4 3
Females	2 7	3 2	3 2	3 3	3 4	3 5	3 6	4 1	4 9	5 0	5 1
Ill defined diseases											
White	0 8	0 6	0 6	0 6	0 6	0 6	0 6	0 6	0 6	0 7	0 7
Females	0 6	0 5	0 5	0 4	0 5	0 5	0 5	0 5	0 5	0 5	0 5
Colored	5 0	4 0	4 0	3 9	3 9	3 9	4 0	4 1	4 6	5 0	5 5
Females	4 8	1 0	3 9	3 9	3 8	3 8	3 9	4 1	4 1	4 7	5 2
All other causes											
White	13 8	9 9	9 9	9 8	9 8	9 7	9 7	9 8	9 6	9 2	8 9
Females	11 8	8 7	8 7	8 7	8 6	8 6	8 5	8 4	8 0	7 5	7 1
Colored	14 5	11 1	11 1	11 1	11 1	11 1	11 2	11 6	11 6	11 2	10 9
Females	13 8	11 1	11 2	11 2	11 3	11 3	11 4	11 3	10 5	9 6	9 3

¹Less than one-tenth of 1 per cent

there is a downward trend to 3.4 at age 50 and then an upward trend to 6.4 at age 90.

For colored males the figure at birth is 8.3 and 9.2 at ages 2 to 5 and then a continuous downward trend to 2.1 at age 90; for colored females the figure is 3.2 at birth and 3.4 at 1 year. Then follows a downward trend to 2.0 at ages 40 to 50 and an upward trend to 2.5 at age 80.

To avoid too lengthy a presentation of this subject, no further discussion will be made of the figures for white females and of the figures for the colored of both sexes beyond calling attention to the very much greater probability that the colored will die of old age or of some indefinite cause.

Commenting briefly upon a few of the figures for white males: at age 50 the probability of having the cause of your death certified as old age is 2.0 per cent, at age 70 the probability figure has risen only to 3.4 per cent, at age 80 it has reached 6.2 per cent and at age 90, 13.4 per cent.

The probability of having some ill-defined disease given as the cause of your death is never great, the figure remaining at 0.6 or 0.7 from age 1 to age 80, inclusive.

For the group, *All other causes*, the probability figure ranges from 9.9 to 9.7 from 1 year to 30 years, inclusive, after which there is a slight downward trend until the figure 8.9 is reached at age 70 and then an upward trend to 9.5 at age 90.

Some very interesting facts—and I may add some very comforting facts—are disclosed by Table II, for example:

1. The probability of dying of heart disease, cerebral hemorrhage or nephritis increases up to and including the age of 70.

On the other hand:

2. After the age of 2 years, the probability that a male will die from an automobile accident continually diminishes.

3. After the age of 2 years, the probability that a male will die from external violence continuously diminishes until up to and including the age of 70.

4. After the age of 15, the probability that a man will die of tuberculosis continually diminishes.

5. After age 50, the probability that a man will die of cancer continually diminishes.

6. After age 60, the probability that a man will die of diabetes continually diminishes.

Comparative Studies in Typhoid Stool Examinations

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THE data presented herein were obtained during our studies to determine the relative merits of mediums recommended within recent years for typhoid stool examinations. The necessity for utilizing any method which offered an advantage was rather urgently brought upon us in the study of a milk-borne epidemic of typhoid fever in which epidemiological evidence pointed to a carrier on whom bacteriological proof was lacking. The suspected carrier had been examined in 1925 in connection with another epidemic, with negative results, and a number of specimens obtained from him in 1926, at the beginning of a second epidemic, were negative. This situation might be explained on the basis of the intermittency of many carriers, and yet the importance of this case made it necessary for us to know just what significance should be attached to our negative findings.

Furthermore, previous studies of typhoid carriers in Ohio have been largely restricted to immediate investigations of epidemics, no state-wide survey, such as Minnesota and Alabama have conducted, having been undertaken in this state. The possibility of such a survey being inaugurated made it very desirable to have data on methods of collecting and examining feces specimens which might be shipped to the laboratory. It has been customary in our laboratory when investigating a suspected carrier to have the fresh specimens forwarded by messenger or by mail to avoid undue delay. Such specimens are then examined promptly by direct plating on Endo or easin-methylene-blue agar. We have appreciated the shortcomings of such a method, especially when there was any delay in delivery of the specimen, and yet in attempting to choose a different method we were somewhat in doubt as to the respective merits of one or another procedure recommended for such work.

Teague and Clurman ¹ in a study of methods for preserving typhoid stools recommended 30 per cent glycerine in saline. Wade, Kelly, and Giblin ² reported very favorable results with this method, and in an extensive series of comparative tests by plating direct, and by plating from the glycerinized specimens, they found a very close agreement in

the number of positive findings of both typhoid and paratyphoid bacilli by the two methods. A number of laboratories are using the plain glycerine-saline. Havens,³ utilizing a brilliant green bile medium in a state-wide survey of carriers, obtained very satisfactory results. However, the use of Havens' original formula by Wade, Kelly, and Giblin⁴ did not seem to give them as favorable results as a mixture of brilliant green-glycerine-saline which they tried out in a comparative study. Later studies by Havens⁵ indicated certain improvements in his original method of preparing the brilliant green bile medium. This change was made by Havens because of the quality of brilliant green then available, and of its inferiority as compared with dyes which he used in his earliest studies.⁶

The question of a suitable brilliant green appears to be an important factor in the bile medium. This matter of variation in the effectiveness of dyes has recently been given careful study by Rakieten and Rettger⁷ and, as will be shown later, our own limited experiments emphasize the desirability for further study of this particular question.

One of the advantages claimed for the brilliant green-glycerine-saline by Wade and associates is that it permits a larger amount of stool to be added, a factor of considerable importance where inexperienced persons may collect the specimen. The principal advantage noted for the brilliant green bile by Havens is that it apparently permits multiplication of typhoid bacilli, thereby offering more opportunity for recovery of such organisms even when the original inoculum contains but small numbers. Because of the different results reported with these mediums, it seemed advisable to give this matter further study, especially since the question of their relative sensitiveness, as compared with direct plating, could be applied to specimens from the carrier in question, and to specimens from a considerable number of convalescents in an epidemic of typhoid fever involving more than 100 cases.

In deciding upon plating mediums for such a comparison, a selection may be made from several varieties, all of which have apparently given satisfactory results. Our choice of brilliant green Endo was based largely on the fact that it combines the universally used Endo with the brilliant green feature utilized with much success by Krumwiede and others, and because this modified Endo had given very good results in Havens' work. We selected E. M. B. agar as a second plating medium because we have found it to be so satisfactory in routine work with the colon-aerogenes group, and also because it has become widely used in this country, and is a very stable stock medium.

As already stated, this study was begun in connection with a typhoid epidemic. The stools from the convalescents who were awaiting negative laboratory tests before final discharge were utilized as experimental material. Through the coöperation of a local county laboratory,* arrangements were made to prepare direct plates from the fresh stools from these convalescents as soon as possible after collection of specimens and at the same time to inoculate each of the two fluid mediums with about $\frac{1}{4}$ gm. The latter tubes were held at room temperature and were plated at 24, 48, and 72 hours on B. G. Endo or E. M. B. agar. All cultures obtained from suspicious colonies on these plates were transferred to triple sugar slants and brought to the central laboratory for final identification. Any cultures showing typhoid or paratyphoid-like reactions on the triple sugar were tested for agglutination. If the agglutination was negative on the first test, the culture was tested again after several transfers on agar. We encountered no cultures which were inagglutinable after such transfers and which otherwise gave typical cultural tests for *B. typhosus*.

The amount of each specimen collected did not always permit making a complete comparative test, but in a total of 132 stools, the procedure outlined in Table I was carried out.

TABLE I
COMPARISON OF DIRECT PLATING AND ENRICHMENT OF STOOLS FROM RECENTLY
RECOVERED CASES OF TYPHOID FEVER

	Direct Plates	Brilliant Green Bile	Brilliant Green Glycerine-saline
	B. G. Endo	E. M. B. Agar	
Positive	15	14	20
Negative	117	118	112
Total	132	132	132
Per cent positive	11.3	10.5	16.9

A total of 21 additional specimens from these cases were examined but on account of insufficient material, only three mediums were used, viz., direct Endo & E. M. B. plates, and B. G. bile enrichment. In 3 of these specimens positive results were obtained in all three mediums. One was positive on direct Endo only, one was positive on direct E. M. B. and on B. G. bile, and two were positive in B. G. bile only.

The foregoing figures show that there is little choice between B. G. Endo and E. M. B. as direct plating mediums, as based on the number of positive findings. The B. G. bile and B. G. glycerine-saline show very satisfactory results as compared with the direct platings. It should perhaps be noted that the amount of inoculum was practically the same in both mediums, and that we did not attempt to study fully

* We are indebted to C. H. Waite, Bacteriologist, Lorain County, O., Health Department Laboratory for his valuable assistance, and to Dr. I. C. Riffin, Health Commissioner, for his cooperation in this work.

the question of over-inoculation which might occur under the usual field conditions. However, in order to check this point we selected a few specimens of known positive stools and inoculated B. G. glycerine-saline lightly, and heavily from the same specimen. In general, the number of typhoid colonies on the plates from these mixtures was proportionate to the amount of inoculum. The same test, applied to the B. G. bile showed overgrowth by other intestinal organisms which either obscured or prevented development of typhoid colonies when more than about $\frac{1}{4}$ gm. was used. Havens cautions against over-inoculation of his medium.

SPECIMENS FROM KNOWN CARRIER

A series of specimens from a known carrier were examined in the same manner as above except that only B. G. Endo was employed for plating. This man was under our direct supervision so that all specimens were delivered promptly and ample material was available. A total of 50 feces specimens collected within a period of several months were examined with the following results:

Total feces specimens from carrier	50
Total number found positive, one or all methods	35
Positive on direct plates, B. G. Endo	26
Positive in B. G. bile	27
Positive in B. G. glycerine	24

Classifying these still further on the basis of individual mediums, we have the following:

Direct plates	+	+	+	+	-	-	-	-
B. G. Bile	+	+	-	-	+	-	+	-
B. G. Glycerine	+	-	-	+	+	+	-	-
Number	17	5	4	0	3	4	2	15

Comparing the total positive findings on each medium we see a very close agreement between direct plating and the two fluid mediums. However, if we classify the results in the manner immediately preceding, we find that there was an advantage in using one or another of the fluid mediums along with the direct platings since there were a total of 9 specimens positive with the fluid mediums but negative with the direct plates, and 4 specimens in which the reverse was true. One cannot estimate the extent to which chance selection of material from a feces specimen might influence the result in one or another medium. It is reasonable to assume that by elaborating on the number of mediums employed, we might expect a few additional positive findings because of this chance selection and the larger amount of the original stool examined, and yet the employment of more than one fluid medium in transporting specimens would be impractical. Furthermore, our results would not justify such a plan. There were 6 specimens positive in B. G. bile which were negative in B. G. glycerine-saline

as compared with 4 specimens giving the opposite result. Both mediums were about equally reliable in this series.

Bact. aerogenes was present in practically every specimen obtained from this carrier and was a disturbing factor on direct plates and the bile medium, particularly on the 48-, and 72-hour plates. The 30 per cent glycerine-saline medium in most instances controlled any tendency to overgrowth by this organism. On the other hand, while the appearance of so many aerogenes colonies on plates from the bile medium was early noted as quite objectionable, this fact did not seriously affect the number of positive findings, especially on the plates made from the bile at 24 hours. It should also be noted here that *Bact. aerogenes* develops more rapidly and forms larger colonies on E. M. B. plates than on B. G. Endo, and for that reason the former is somewhat less desirable in specimens containing this organism.

We attempted to control the overgrowth of aerogenes by using glycerine in the bile in a concentration which preliminary tests had shown to be sufficient to partially restrain this organism as well as *Bact. coli*. This required about 14 per cent of glycerine. A small series of specimens collected weekly from this carrier were examined with direct plates, B. G. bile and B. G. bile + 14 per cent glycerine. At this time his stools contained rather large numbers of typhoid bacilli so that it is perhaps not surprising that we obtained positives by all three methods on the 12 specimens examined. In only one instance during this period were there less than about 100 typhoid colonies on direct plates.* On this day only 2 typhoid colonies were found on direct B. G. Endo, but we were successful in isolating the organisms from both liquid mediums. This was somewhat surprising in view of experiments to which we will refer later. While on the basis of these figures there was little apparent difference between the efficiency of the bile, with and without glycerine, it should be noted that whereas the former was uniformly positive on the three successive platings and kept the aerogenes organisms somewhat in check, the bile without glycerine was negative in 1 specimen at 48 hours and in 3 specimens at 72 hours, the plates from these tubes showing almost all aerogenes colonies.

ADDITIONAL COMPARATIVE TESTS

A further comparative series was carried through direct platings, B. G. bile, B. G. glycerine-saline, and B. G. bile + 14 per cent glycerine. For this study both naturally infected stools from carriers and active cases, artificially inoculated stools, and specimens obtained

* Estimates based on gross appearance of colonies, a few representative ones being selected for confirmation.

in routine examinations for possible carriers, were utilized. The results are shown in Table II.

TABLE II

	ARTIFICIALLY INFECTED STOOLS			
	B. G. Endo Direct	B. G. Glycerine- saline	B. G. bile	B. G. bile + 14 per cent glycerine
Positive	12	11	10	11
Negative	2	3	4	3
Total	14	14	14	14
	NATURALLY INFECTED AND ROUTINE STOOLS			
	B. G. Endo Direct	B. G. Glycerine- saline	B. G. bile	B. G. bile + 14 per cent glycerine
Positive	16	17	14	17
Negative	40	39	42	39
Total	56	56	56	56

This series again emphasizes the close agreement between direct plating and both of the enrichment methods employed in our earlier series as well as a rather close agreement between results in the B. G. bile with, and without glycerine. A few specimens in this series represent positive stools which were held several days after the first test, to determine the relative efficiency of the methods where the number of typhoid bacilli would presumably be constantly decreasing. In 2 specimens held 3 and 4 days respectively, the direct plates were negative and all three liquid mediums gave positive results, while in 1 specimen held 8 days, the opposite was true.

In 20 of these specimens we used the original Teague and Clurman method of 30 per cent glycerine-saline, in addition to the methods shown in Table II. Direct plates from this medium gave the same percentage of positives as the B. G. glycerine-saline, but it was noted in the majority of these positive specimens that the second and third day's platings from the plain glycerine-saline gave more typhoid colonies than the G. B. glycerine-saline.

QUANTITATIVE EXPERIMENTS

In order to determine the approximate minimum number of typhoid bacilli which could be detected by the different methods, the experiment outlined in Table III was performed. This experiment was then duplicated, using a specimen with a different content of typhoid bacilli for the inoculum. The results of the two experiments agreed as closely as one might expect when dealing with such mixtures as fecal suspensions.

It is of interest to note that with two exceptions, no positive results were obtained with the technic we employed, in any of the liquid mediums when less than about 4500 typhoid bacilli were added to 15 c.c. of each medium. It is difficult to make accurate calculations on such mixtures but in the specimen used, the ratio of typhoid colonies to other fecal types which developed on direct Endo plates was about 1-50. There

was no evidence of multiplication of typhoid bacilli in any of the liquid mediums but a gradual decrease of these organisms and a more rapid decrease of other forms. On this basis it is not so surprising, therefore, that a considerable number of typhoid bacilli must be present in the original inoculum to compensate for the dilution. A rough theoretical calculation based on the amount of sample added and the size of the loop used for plating indicated that the figures given in Table III are approximately what one might expect in the absence of any multiplication of typhoid bacilli. In short, these calculations indicate that there should not be a wide difference between positive findings by direct plates and by the use of these liquid mediums. The quantitative tests and calculations appear to confirm our results in the qualitative series.

RAKIETEN AND RETTGER METHOD

In the midst of this experiment the recent studies by Rakieten and Rettger⁹ on a brilliant green enrichment medium came to our attention. Their results are indeed striking as compared with our experience in direct plating. For example, these authors report that in 204 specimens of artificially inoculated stools not a single positive was obtained on direct plates while 93 per cent of the specimens gave positive results

TABLE III
RESULTS IN DIFFERENT MEDIA INOCULATED WITH INCREASING DILUTIONS
OF SUSPENSION OF TYPHOID STOOL

OF SUSPENSION OF TYPHOID BACILLI													
	1			2		3		4		5		6	
Amount of stool used	About ¼ gram*			1/10 dil. of No. 1		1/100 dil of No. 1		1/1,000 dil. of No. 1		1/10,000 dil. of No. 1		1/100,000† dil. of No. 1	
Typh. bacilli**	4,500,000			450,000		45,000		4,500		450		45	
Other bacteria**	237,000,000			23,750,000		2,375,000		237,500		23,750		2,375	
	Days	Typh.	Others	Typh.	Others	Typh.	Others	Typh.	Others	Typh.	Others	Typh.	Others
30 per cent	1	10	x	3	x	3	54	0	18	1	5	This dilution was not inoculated into liquid mediums,	
Glycerine saline	2	5	x	3	x	0	46	1	12	0	1		
+1/1,500 Brilliant	3	7	x	12	40	2	4	1	2	1	0		
Green	4	0	x	0	20	0	15	0	2	ng.	ng.		
	5	3	x	1	15	2	13	0	2	0	1		
	7	0	14	0	7	0	4	ng.	ng.	ng.	ng.		
Brilliant Green Bile	1	4	x	8	x	1	8	1	12	ng.	ng.		
1/200	2	1	x	3	x	0	7	0	4	ng.	ng.		
	3	0	x	14	x	3	24	0	x	0	13		
	4	0	x	0	x	0	x	0	x	0	18		
	5	0	x	0	x	0	x	0	x	0	40		
	7	0	x	0	x	0	x	0	x	0	10		
Brilliant Green Bile	1	12	x	9	x	5	30	3	15	ng.	ng.		
1/200 +14 per cent	2	2	x	4	x	4	28	0	13	ng.	ng.		
glycerine	3	2	20	8	50	1	3	ng.	ng.	ng.	ng.		
	4	2	24	0	x	0	10	0	0	0	1		
	5	0	35	1	25	1	15	ng.	ng.	ng.	ng.		
	7	0	x	0	12	ng.	ng.	ng.	ng.	ng.	ng.		
30 per cent	1	13	x	14	x	4	60	1	4	0	3		
Glycerine saline	2	3	x	11	x	6	35	0	1	0	1		
	3	12	x	4	x	6	26	ng.	ng.	ng.	ng.		
	4	1	x	0	x	0	35	ng.	ng.	ng.	ng.		
	5	3	x	1	x	0	38	ng.	ng.	ng.	ng.		
	7	0	20	0	18	0	4	ng.	ng.	ng.	ng.		

This dilution was not inoculated into liquid medium.

*Portion size of pea

**Estimates based on colony count on Endo inoculated with 0.1c.c. of 1/100,000 dilution

x=Colonies too numerous to count. ng=No growth on plate.

after enrichment in brilliant green peptone broth. Although no numerical data are shown to indicate the probable density of typhoid bacilli in their specimens, it would appear that by inoculating the stools "lightly" with a typhoid culture, the bacilli were much below the concentration we have found necessary to obtain a positive result by direct plates. The Rakieta and Rettger medium is not suitable for field use since a very light inoculation is necessary, but their enrichment method might prove valuable for secondary inoculation from feces suspensions preserved and transported in glycerine. That is, one might recover typhoid bacilli from such suspensions by using their brilliant green peptone broth where direct plating from the glycerine was negative due to the small number of bacilli in the glycerine. We are making a further study of this question. In our limited experiments we have been unable to obtain a dye which gave the favorable results they have reported but we have recently received from Dr. Rakieta a sample of two lots of brilliant green which gave satisfactory results in his work. We have not had an opportunity to test these samples completely in comparison with ten other brands we had previously tried, all of which gave rather discouraging results.

PLATING MEDIUMS

Although a considerable variety of plating mediums have been recommended by different workers, it appears that Endo and E. M. B. agar have gained most favor. However, in view of the recent report of Rakieta and Rettger, it seemed advisable to make a few comparative tests with several mediums in order to determine the relative value of the two mediums we had employed. To this end in several experiments the mediums listed below were inoculated with the same amount of fecal suspensions containing typhoid bacilli, both natural and artificial mixtures. Our results, based on number of typhoid colonies, number of colonies of associated bacteria, the general type of typhoid colonies, ease of recognition, etc., may be briefly summarized as follows: Plain Endo, B. G. Endo, Plain E. M. B., Levine E. M. B., Robinson and Rettger Endo, Krumwiede B. G. agar, and Conradi-Drigalski agar plates were inoculated as uniformly as possible from the same suspensions. All plates were incubated at 37° C. and readings were made at 24 and 48 hours.

All these mediums gave reasonably satisfactory results in the development of typhoid colonies, the Conradi-Drigalski showing somewhat less colony differentiation than the other plates. The Krumwiede agar showed a tendency to more luxuriant growth of *Bact. aerogenes* in two specimens containing this organism.

The Robinson and Rettger Endo produces very pretty typhoid colonies and there is less tendency to diffusion of the red color from the acid producers. However, when compared with B. G. Endo on the basis of prevalence of other colonies and the general differentiation of these from typhoid colonies, we have not observed enough superiority of any of the other mediums to justify adoption of them in preference to the B. G. Endo. This question is largely one of personal choice based on wide experience with one or another type of medium. There is some advantage in using more than one plating medium and in this event one might utilize both the B. G. Endo and Robinson and Rettger Endo.

BRILLIANT GREEN DYES

Since so much depends on brilliant green in many of the mediums used in typhoid work, it is of great importance to have reliable and fairly uniform supplies of this dye. There is apparently considerable difference in the efficiency of different lots of brilliant green. Most workers have noted the necessity for careful titration of such dyes when added to solid or liquid mediums and have commented on these variations. Havens pointed out his inability to get uniform lots and was compelled to modify his original formula for the B. G. bile to meet this situation. Rakieten and Rettger have recently shown that only a few samples out of a number tested gave satisfactory results. These authors have also shown the necessity of controlling the pH of their peptone broth medium in order to get the most effective brilliant green action.

SUMMARY

Comparative studies were made to determine the efficiency of preservative or enrichment mediums as based on results obtained by direct platings from the same specimens. Specimens employed consisted of stools from recently recovered cases, a few active cases, a permanent carrier, and routine examination for detection of carriers, as well as artificially inoculated stools.

Very close correlation in positive results was obtained with the direct platings on B. G. Endo, B. G. bile medium, and B. G. glycerine-saline. Both of the latter mediums were found to yield about the same number of typhoid colonies although the number of associated forms was much less in the glycerine mixture. No apparent multiplication of typhoid bacilli was noted in our bile preparations.

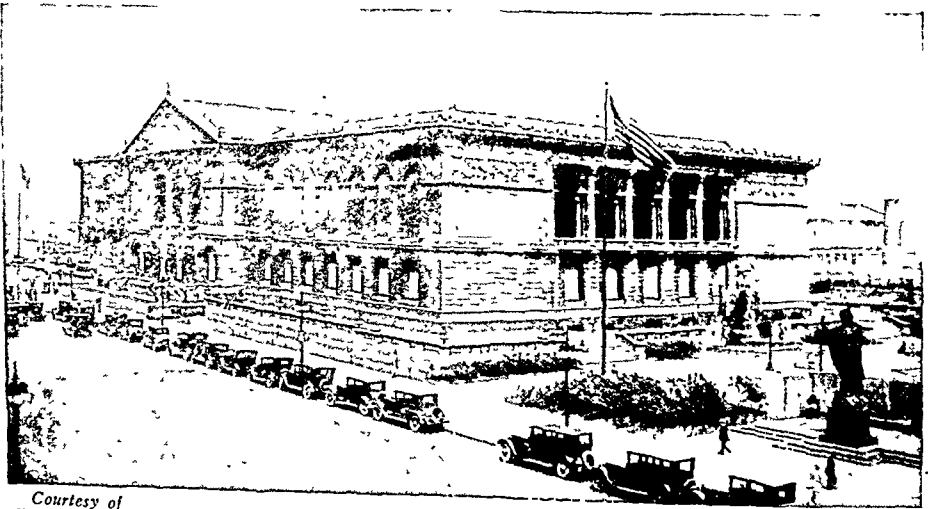
Quantitative tests further indicated a close degree of efficiency between bile and glycerine mediums, and showed little, if any, multiplication of typhoid in the former. These tests indicated that about 4500 typhoid bacilli must be added to 15 c.c. of either medium in order to recover them at the end of 24, 48, or 72 hrs.

Comparisons of various types of plating mediums showed close agreement in the percentage of positive findings. There are, however, some other factors which influenced us in continuing the use of B. G. Endo, principal, among which is its restraining action on related forms without seriously affecting the number and character of the typhoid colonies.

Our experience parallels that of other workers in respect to the variation in different lots of brilliant green dye and emphasizes the necessity for further study of this dye as to its selective action on typhoid bacilli, and the uniformity of different lots.

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ART INSTITUTE, CHICAGO, ILL.

Canned Foods and the Public Health*

YOUR committee, following up last year's report¹ on food preservation legislation in the United States, has sought to continue for the present year, the general subject of preserved foods with special reference to fruits and vegetables.

Powell² states:

The canning and preserving of food products is an important factor in household management and of even greater importance in national economy, since the conservation of foodstuffs, from the time of production and natural time of consumption to a later time, makes for a more varied and adequate diet, and that secured at a lower economic cost.

Since the interest in this subject is almost universal, some statistics relating to canned food production were gathered. In addition to analyzing these data, a very brief summing up of the present status of canned foods based on recent contributions to the subject has been attempted.

The statistics given in Table I will no doubt prove enlightening to many in that they portray the huge magnitude of the canning industry. We have included foods other than fruits and vegetables in this com-

TABLE I
COMMERCIAL CANNED FOODS
APPROXIMATE PRODUCTION IN THE UNITED STATES *
(Quantities in millions of pounds)

	1904	1914	1919	1925
Vegetables	1,115	1,703	2,148	3,426
Fruits	321	499	1,046	1,294
Meats & Meat Products....	...	235	467**	119**
Marine Products***	142	454	403	495
Milk .....	...	873	1,791	1,931
Soups .....	...	154	184	313
Total	1,578	3,918	6,040	7,579

* Based on Statistics, U. S. Census Bureau, Bureau of Fisheries, and National Canners Association

** Includes only products packed in slaughtering and meat packing establishments

*** Includes Alaskan production

pilation, though they come, of course, outside the scope of this committee. Many soups are partly of vegetable composition and may properly be considered a vegetable product. Some marine products are also canned with tomato sauce, olive or cotton seed oil or mustard, all manufactured plant products. Fabricated foods such as pickles, catsup, mayonnaise, jams, jellies, etc., and many glass packed foods,

* Report of the Committee on Fruits, Vegetables and their Products, delivered before the Food and Drugs Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 21, 1927.

are purposely omitted from the table because of the difficulty of obtaining reliable data concerning the amounts annually packed.

Both exports and imports of canned foods have been considered. The amount exported^{*} in 1925 was 605,000,000 lbs. or 8 per cent of the total. Milk alone makes up about one-fourth of this volume. These amounts are insignificant when compared with the domestic consumption. Other countries, except Canada, fall far behind the United States in the production and consumption of canned foods. Imports^{*} totaled 165,000,000 lbs. in 1925.

The per capita consumption of commercially canned foods using the data in Table I after allowance had been made for exports and imports and considering the population of the United States as 115,000,000, is 62.1 lbs. The per capita consumption of commercially canned fruits is 9.0 lbs. and of vegetables 28.4 lbs. Hollingshead^{*} states that canned fruit and vegetable production was 9.7 *cans* per capita in 1905; 15.1 in 1914 and 24.9 in 1925. After converting these figures to pounds they agree closely with ours.

It is estimated that the home canned food production in the United States is a billion lbs., of which 200 million lbs. are fruits and 550 million lbs. are vegetables.* The total per capita consumption of home canned foods would be 8.7 lbs.—1.7 lbs. of fruits and 4.8 lbs. of vegetables.

We do not believe we are justified in separately treating commercial and home packed foods. For all practical purposes they are similar in nutritive value, palatability and cost. Considering them together we reach a total of canned foods annually consumed per capita of approximately 70 lbs.

What effect, if any, has the consumption of this tremendous amount of canned fruit, vegetables, etc., upon the nation's health? The annual production and consumption of these foods has been rapidly increasing since the Civil War, yet we know of no impairment to the general well-being of the people resulting from it. Canned foods are cooked in hermetically sealed containers which prevent recontamination until opened. The nutritive and calorific values of the same fruit or vegetable, fresh and canned, are essentially the same. Prescott^{*} states:

While it is possibly true that dehydrated vegetables like canned vegetables, contain less antiscorbutic material than the original vegetables in the fresh condition, this does not appear to constitute an argument against their use, as, so far as can be determined, they supply the same roughage value as fresh vegetables, the same salts and the same fuel values.

To quote an editorial in our own JOURNAL:

^{*} Based on Census reports, cost of living studies conducted by Bureau of Home Economics, U. S. Dept. Agr., Reports of the Extension Service on 4-H Club Work in various states and from data compiled by the Dept. of Agricultural Econ. Mass. Agr. College.

While fresh food is, of course, the ideal, it will probably never be available as a general thing, but we can be assured that with the knowledge we have at present and are constantly acquiring, practically all foods can be preserved not only with safety, but with their nutritive properties only slightly altered.

A greater degree of heat is usually used in the canning operation than in kitchen preparation, though an increase in the temperature of cooking alone has not been shown to impair the wholesomeness of fruits and vegetables. On the contrary the heating of fruits and vegetables in a closed container without access to atmospheric oxygen serves to prevent the loss of certain accessory food factors such as the antiscorbutic vitamin. The recent investigations of Eddy⁸⁻¹⁰ and others have demonstrated that although different vegetables and fruits act differently, in most cases vitamins A, B, D and E are relatively uninjured while C is impaired to a greater or lesser extent by the canning process. Eddy⁸ in discussing his studies on canned spinach, cabbage and apples, states:

In cooking the foodstuff, the canner has not increased vitamin destruction over that produced by the home cooking of these vegetables and fruit, but has actually accomplished his purpose with less destruction in the case of the antiscorbutic factor.

The subject of food poisoning has been much discussed and investigated during the past ten years and there are several papers on this subject to be presented at other sessions of our section by specialists who have carefully studied the problem.

Outbreaks of botulism from canned foods have apparently been effectively checked by scientific investigation and control of sterilizing processes in commercial canning, and by the revision of directions for home canning so that pressure cooking is advocated for non-acid foods. The National Canners Association¹¹ has received no reports of botulism from commercially canned foods since 1925. Savage¹² in England and others have reported the presence of thermostable toxins of the paratyphoid-enteritidis group in canned foods. Due to this group's inability to form spores, it appears unlikely, except accidentally, that living cells of this group of bacteria could survive in such foods. Geiger and Benson¹³ as well as Koser¹⁴ demonstrated that this group of organisms may proliferate and even elaborate toxin in certain artificially inoculated canned vegetables, meats and marine products. Your committee feels strongly the need of further investigations upon this group of bacteria in their relation to foods.

The investigation on effect of salts of tin upon the human health has been admirably handled by the Bureau of Chemistry, U. S. Department of Agriculture, and these findings will go a long way to clear up the long existing haze surrounding this question.

Likewise the question of adulterations, either with or without public health significance, in canned or fresh fruits, vegetables and their products is being constantly investigated by various municipal, state and federal agencies. The violations are becoming less numerous than formerly. Some of the regulations have little or no bearing upon the public health. For example, the Commissioner of Agriculture for Massachusetts reported," "The percentage of adulterated or misbranded food that is produced in or brought into New England is practically negligible." Campbell, Director of Regulatory Work, U. S. Department of Agriculture, likewise has reported a reduction in the number of prosecutions brought under the Federal Food and Drugs Act from 818 in 1920, to 258 in 1927 and in seizure cases from 1407 in 1920 to 695 in 1927.

Great progress is being made on the subject of infant feeding. Accurate and dependable information should be given to the public regarding dietetics. The knowledge of the kinds, quantity and values of each food used for human consumption is eminently desirable and education along these lines is fully as important as a wholesome supply. Because of their moderate cost, average quality, accessibility and ease of preparation, canned fruits and vegetables have greatly facilitated the use of correct, palatable diets, particularly for children.

Canned foods, whether prepared in the home or in commercial canneries, regardless of the type of container, are sound, wholesome, and safe. Their continued use is commended. The advantages to the American health from the use of canned foods in the diet can hardly be over-estimated. Improvements are possible and with the aid of research and intelligent regulation, it is believed that the future of the industry is bright. The nation may have faith in its canned foods.

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Test for Phenolic Tastes and Odors in Water After Chlorination

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THE extensive installation of by-product coke ovens in the United States during the war and since, has introduced a new problem in public health work in the matter of control of disposal of phenolic waste waters produced at such plants.

Even in dilutions of 1 to 50,000,000, these wastes are capable of producing offensive tastes and odors in public water supplies derived from streams containing them.

It has been continuously observed that the consumers of such offensive water supplies refuse to drink such water even though it be bacterially safe and in lieu thereof use palatable waters obtained from springs and other sources, which in several instances have been the cause of outbreaks of typhoid fever.

Practically all of the health departments of states in the Ohio River Basin are parties to the Ohio River Inter-State Stream Conservation Agreement,* the basic principle of which is to provide for coöperation between these state health departments in the protection of public water supplies.

The outstanding instance of success of this agreement is in the installation at a large percentage of the by-product coke oven plants on the Ohio River Basin, of either works for the complete elimination of the phenolic waste waters by their use for coke quenching or the substantial treatment of the waste waters where it is not practicable to use them for coke quenching.

On February 6 the Pennsylvania State Department of Health called a conference in Pittsburgh which was attended by representatives of most of the by-product coke oven plants and some state sanitary engineers from the Ohio River Basin, the purpose being to effect more perfect coöperation between the industry and the various state health departments.

One of the important matters considered at the conference was the establishment of a tentative standard technic for testing samples of

* For report of October 18 meeting at Cincinnati, see *A. J. P. H.*, 18, 1:104 (Jan.), 1928.

water containing these phenolic wastes, and the meeting appointed a committee of expert chemists, all of whom are experienced in this work, to prepare such a technic.

Their report which is given here may prove of interest to public health workers.

REPORT OF MEETING CALLED BY PENNSYLVANIA DEPARTMENT
OF HEALTH

At a meeting held in Pittsburgh, Pa., February 6, 1928, there were representatives of the following:

Pennsylvania State Department of Health
Ohio State Department of Health
Kentucky State Board of Health
Carnegie Steel Company
Youngstown Sheet and Tube Company
Republic Iron and Steel Company
Jones and Laughlin Steel Corporation
Bethlehem Steel Company
United Gas Improvement Company
The Koppers Company

W. L. Stevenson, Chief Engineer of the Pennsylvania State Department of Health, chairman of the meeting, appointed a committee to consider the test proposed by J. W. Ellms of Cleveland, O., and report their opinion. The committee as appointed consists of F. W. Sperr, Jr., Director of Research, The Koppers Company; W. H. Fulweiler, Chemical Engineer, The United Gas Improvement Company; F. E. Daniels, Chief, Industrial Waste Section, Pennsylvania Department of Health; and O. O. Malleis, Chief Chemist, The Koppers Company.

The committee has considered the method as presented and is of the opinion that while in principle the method may be satisfactory for water works practice, it should be substantially modified to render it generally applicable. It is believed that in general a method of this sort should embody the principle of systematic dilutions with a test of each dilution, so that quantitative results can be secured. On this basis the committee has therefore drawn up a tentative method which is herewith submitted, not as final and binding, but for the purpose of inviting trial and comment. It is hoped that this method will be thoroughly examined and tried by all who are interested in the subject, and the committee would appreciate having reports of the results obtained together with any suggestions for modification or improvement that may be considered necessary.

The tentative method proposed by the committee is as follows:

1. This test is designed as a measure of the so-called phenolic tastes and odors in water after chlorination.

2. Take 500 c.c. of the material under examination, acidulate with sulphuric acid until acid to litmus, and distil off 250 c.c. Catch the distillate in a 500 c.c. volumetric flask, make up to mark with distilled water and dilute as follows: 1 to 10; 1 to 100; 1 to 1000; etc., preparing as many dilutions as may be necessary.

3. Take 200 c.c. of the distillate in the volumetric flask after making up to mark (this representing the original material undiluted) and a like amount of each successive dilution. Treat with a slight excess of chlorine water (a total of 0.3 p.p.m. of chlorine is usually sufficient). Let the sample stand for 15 minutes and then boil until excess of chlorine is removed as evidenced by test with orthotolidin.

Make the odor test by smelling the hot liquid. Make the taste test after the liquid is cooled. In the taste test, swallowing a small quantity of the liquid is the best method for revealing the presence of taste producing substances.

4. Results shall be expressed as the lowest dilution in which the taste and the odor are negative.

Pittsburgh, Pa.

February 27, 1928.

Committee

F. W. Sperr, Jr.

W. H. Fulweiler

F. E. Daniels

O. O. Malleis

NOTE: Communications relative to the method may be addressed to F. W. Sperr, Jr., Mellon Institute, Pittsburgh, Pa.

Welfare Measures for Young Workers

FOR the protection of the health of young workers in Austria, who suffered as the result of the wartime and post-war conditions, a series of measures are now in effect. A law provides 2 weeks of annual vacations with pay for all workers under 16 (1 week is required for workers over 16). Vacation houses for young workers, supported mainly by public social welfare agencies, have been established by the Ministry of Social Welfare. Persons unable to pay are maintained free of charge; others pay a nominal fee. Medical supervision is provided free.

The municipalities and the continuation-school authorities provide arrangements for athletics, hiking, and other health promoting activities, for young workers. An extensive system of vocational guidance has been established in many places. Supervision over the working conditions of apprentices and young industrial workers is exercised by workers' organizations and by factory inspectors.—*Lehrlingsschutz. Jugend-und Berufsfursorge*, Vienna, Apr., 1928, p. 9.

EDITORIAL SECTION

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WHY SMALLPOX?

FROM the point of view of relative mortality rates, smallpox has not in recent years has been of great importance in this country. In the 7 years 1921-1927 there were registered in 47 states and the District of Columbia, 3929 deaths from smallpox. (Rhode Island had no deaths from the disease during the period.) That number means an average of 561 per year, ranging from 135 in 1927 to 894 in 1924; and it is a small fraction of the total number of deaths. Moreover, each of several diseases, as well as the automobile, is annually responsible for many times the deaths due to smallpox. Nevertheless, health officers and health workers generally make more ado about the relatively few smallpox cases and deaths than they do about the much more serious measles, or pneumonia, or whooping cough.

The reason for this emphasis is clear enough to every informed person. While we do all we can to prevent these more destructive diseases, we cannot do much more than isolate patients and watch contacts. With smallpox, however, every case proclaims the failure to use well understood and practicable means of prevention. This disease, in proportion to the number of cases, is a constant reproach to the intelligence of any civilized community, since it is virtually 100 per cent preventable through systematic universal vaccination and re-vaccination. It is for these reasons that we consider it worth while to survey the smallpox situation from time to time, and to take account of our accomplishments or failures.

A compilation of the returns for 1927 shows that for the fifth successive year this country leads the world, outside of India, in the number of smallpox cases. We had 38,498 cases of smallpox as against 33,343 in 1926. And in the first 3 months of this year there were 17,242 cases as against 14,655 in the corresponding period of 1927.

Those interested in promoting the use of vaccination as a preventive of smallpox have relied for their arguments upon the striking preponderance of smallpox among the unvaccinated. For years the available records in this country show consistently about 91 per cent of all smallpox cases to be among the unvaccinated, about 7 per cent among those vaccinated more than 7 years previously, and 2 per cent among those vaccinated within 7 years, including vaccinations after exposure. Records of this kind are now available from less than half the states. It would be desirable to have all smallpox reporting include vaccinal history.

Smallpox history in this country has added to the experience of European countries another indication of the protective value of vaccination. Before the introduction of vaccination, smallpox was generally a children's disease—in severe epidemics it was often a disease of infancy. With the spread of vaccination the incidence of smallpox passed to progressively higher age levels. In recent years, however, communities in which vaccination has been neglected show a steady decline in the age level of smallpox cases. This would seem to be of sufficient significance to warrant the trouble of compiling smallpox statistics by ages as well as by vaccinal history, and by administrative areas.

The importance of suitable vaccination laws may be inferred from a comparison of the records for our various states on the basis of the different types of regulation that obtain. In 12 states with a total population of 36,680,000 (1926 census estimate), in which vaccination is required as a condition of school attendance, there were in the 7-year period 1921-1927, 25,124 cases of smallpox with 205 deaths. This is an average annual case rate of 9.8 per 100,000 of population. In 8 states in which the requirement of vaccination by officials is explicitly prohibited by law, there were, during the same period, 79,281 cases with 1277 deaths in a population of 12,133,000. This means an average annual case rate of 93.3 per 100,000, or nearly ten times as high in one group of states as in the other. In the states that leave vaccination requirements optional with local school or health authorities, or that permit "compulsory" vaccination during an epidemic, the case rate was 49.9 per 100,000.

Legislation alone, however, does not solve the problem. Last year Kentucky and West Virginia had respectively 350 and 320 times as many smallpox cases per capita of population as had Massachusetts, with similar statutes. On the other hand, Maine, with a relatively poor law, from the standpoint of public health protection, has for years maintained a low incidence of smallpox because it has not been

seriously exposed to an epidemic. Consistent law enforcement is as important as suitable statutes, but under the individualistic tradition that prevails in many parts of our country, universal vaccination, including systematic revaccination, must wait upon a better education of the public at large to an understanding and appreciation of preventive measures.

MAN'S LAST SPECTER—MENTAL DISEASE

PUBLIC health workers, in common with other observant persons, are regarding with mounting concern both the vastness of the problem created by mental diseases in this country and the meagerness of the resources for combating it. The statistics of the situation are impressive:

For example, there are virtually as many beds in hospitals and institutions for mental disease in the United States as there are beds in hospitals *for all other kinds of sickness combined*. The exact percentage is 44,* and not only is every bed occupied, but most institutions are from 20 to 35 per cent overcrowded.

Fifty thousand men and women never before mentally sick enter hospitals for the insane every twelve months.

From ten to twenty-one cents of every dollar collected by each state for taxation goes to the maintenance of public institutions for the mentally ill.

There is much more to the same effect. But these figures refer only to the institutional aspects of mental disease—the end results so to speak—an aspect many have suspected is probably of less importance than the extramural portion of the problem. In the offices of general practitioners and in the dispensaries of general hospitals are countless men and women whose ailments, given physical expression perhaps, are nevertheless really due to worries, fears, disappointments, disturbing memories, unsatisfied cravings, and the like. Their happiness and their business efficiency is frequently much impaired, and if they fail to receive early treatment, many of them later will have to be cared for in mental disease hospitals.

Still earlier in life are to be found countless children in our schools, our homes and some already in our juvenile courts, who display to the trained observer the signs of mental disease in the making. From a preventive point of view, obviously, most can be done with this latter group. For the great majority of them it is not yet too late to divert unhealthy personality traits and habits into more wholesome channels,

* As ascertained recently by the American Medical Association and others.

or to adjust the maladjusted so that tendencies towards delinquency (always a sure sign of maladjustment) or other anti-social displays of behavior may be corrected.

The difficulty in sidetracking towards health these potential victims of mental disorder is twofold: first is the obstacle of identifying them at an age when prophylactic measures can be applied with greatest hopes of success; second is the troublesome and highly complicated task of actually applying such measures. In the field of mental hygiene, identification of the potentially maladjusted means essentially *education*—education of physicians, nurses, social workers, teachers, and others, in the significance of symptoms that often enough are disguised as physical disorders, or are interpreted as manifestations of anything from “badness” or “sheer cussedness” to “original sin.” It also means education of parents, for it is the fathers and mothers usually who, with excellent intentions, create the undesirable personality traits and difficulties that characterize the “problem” child. Public health workers will do well to bear in mind that “problem children mean problem parents.”

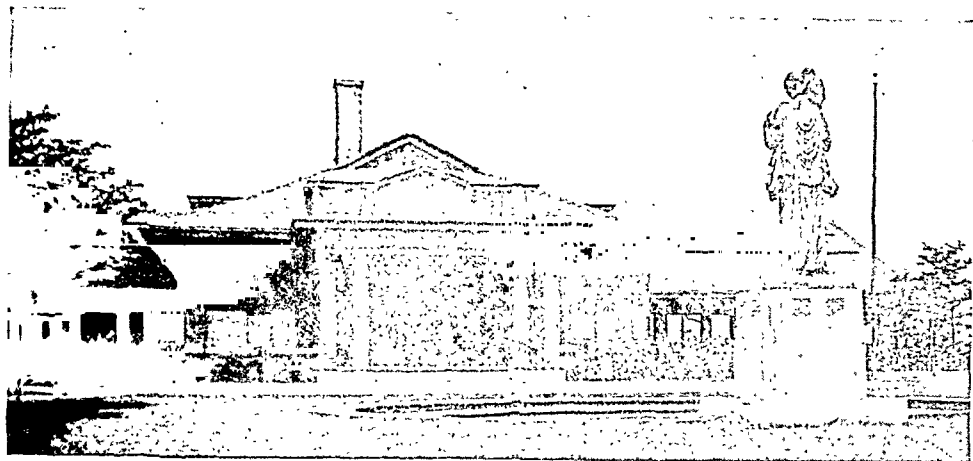
Fortunately mental hygiene educational programs are increasing rapidly. For physicians and technical workers, fellowships and special training courses are being instituted in many of the larger medical centers. Psychiatry, with special emphasis on its social and community aspects, is making inroads on the curricula of numerous medical schools. For parents and the general public, parent-teacher organizations, mothers’ clubs and similar agencies are conducting many courses of a non-technical nature designed to bring to their audiences some of the simpler and more firmly established facts about mental hygiene and child training.

The actual measures of attack, however, in a preventive program call for the *highest professional skill and special training*. Child guidance clinics and similar clinical agencies, when properly conducted, probably represent the highest point yet reached in the development of machinery for dealing with maladjusted children. By the same token they also represent one of the most complicated pieces of machinery. It is no simple matter to deal wisely and efficiently with “problem” children, although it is admitted there often has been given a deceptive coloring of simplicity to the description of certain pieces of work accomplished.

Physicians, social workers, and psychologists specially trained in psychiatric technic are indispensable for such clinics, and the case load (all too often the determining factor in other types of clinics) is bound to be low if good work is to result. Of course, there are some types of

mental hygiene clinics that serve a useful purpose as diagnostic centers alone, but when treatment is included in a clinic's function, the number of cases to be effectively dealt with will necessarily remain small. This handicap has been surmounted in many of the larger child guidance clinics by making their educational possibilities second only in importance to their primary function of service to patients. Thus such clinics aid other case-working agencies in the community to acquaint individual workers with the methodology of child guidance work in order that numerous of the less complicated cases may in the future be handled directly by the non-psychiatric agency with a modicum of technical supervision. Under such a plan the low case load and comparatively high cost of a child guidance clinic are justified.

A fertile and responsive field awaits cultivation by public health workers who interest themselves in mental hygiene, especially at first in its educational aspects. The layman, often well informed about typhoid fever, diphtheria or hookworm, knows little of mental disorders, their prevention and their early treatment. To instruct him is not easy; there may be no bacilli to show under the microscope; no change in the brain to demonstrate. The causes are complex and elusive; preventive measures will not bring immediate returns, but new weapons of attack have been forged; much technical information awaits public interpretation; and renewed hope that "Man's Last Specter—Mental Disease" may some day also be vanquished is warranted by the progress already made.



Courtesy of
Chicago Daily News—

CHICAGO DAILY NEWS SANATORIUM

CHICAGO—THE MEDICAL CENTER

CHICAGO'S medical institutions are among the most interesting and valuable places to be visited by public health workers, who attend the 57th Annual Meeting October 15-19. During the ten years which have passed since our last meeting in that city, vast strides have been made there not only in the development of institutions for medical treatment, education and training, but also in the facilities for and contributions to medical research of profound importance.

Long before Chicago attained prominence as a great industrial and commercial city, it became well known for achievement in the field of medicine by members of the faculty and staff of Rush Medical College, which was founded by the State of Illinois in 1837. Here Professor James V. Z. Blaney in 1847 first used "laughing gas" as an anesthetic, to be followed the next year by Professor Daniel Brainard in his successful use of chloroform.

MEDICAL SCHOOLS IN CHICAGO

Today Chicago has 4 Class A medical schools with an enrollment of students, graduating over 350 annually. These are:

- 1 Northwestern University School of Medicine
- 2 University of Chicago (Rush School of Medicine)
- 3 University of Illinois College of Medicine
- 4 Loyola University School of Medicine

On the McKinlock or downtown campus of Northwestern University and among a group of unique and modern educational buildings is the new Montgomery Ward Memorial Medical-Dental center which was opened last fall. It is housed in a mammoth 14 story building with 6 additional stories in the tower, and cost about \$8,000,000 to erect and equip—the gift of the late Mrs. Montgomery Ward. This is the tallest educational building in the world. The architecture is modern Gothic in style, and the various units are thoroughly equipped for rendering splendid service to humanity. The first 7 floors house the medical school, the next 6 the dental school. The medical clinic which now occupies the lower 3 floors will later be incorporated in the new General Hospital and Clinic to be built on the campus immediately south.

The new Medical Unit recently completed at the University of Chicago is one of the best equipped medical institutions to be found anywhere, costing in the neighborhood of \$5,000,000. It is located on the Midway on the University Campus, and is destined to be a center for medical education and research of far reaching importance and influence.

The College of Medicine of the University of Illinois has made rapid strides in recent years. The new campus is

located on Polk Street immediately adjacent to Cook County Hospital. When the projected additions to the present plant are completed, there will be a student capacity of approximately 800. The new buildings are of Gothic style in brick. The Research Hospital, the Research Laboratory, the Psychopathic Hospital and the Orthopedic Hospital have been completed. The Nurses Home is under construction; the student laboratories and dental infirmary, as well as the teaching amphitheatres are now being planned. At the present time the Research Hospital has approximately 150 beds available. The dispensary is one of the largest in the city and forms an invaluable aid for instruction of students in practical medicine. The library of the medical school is one of the largest in the country.

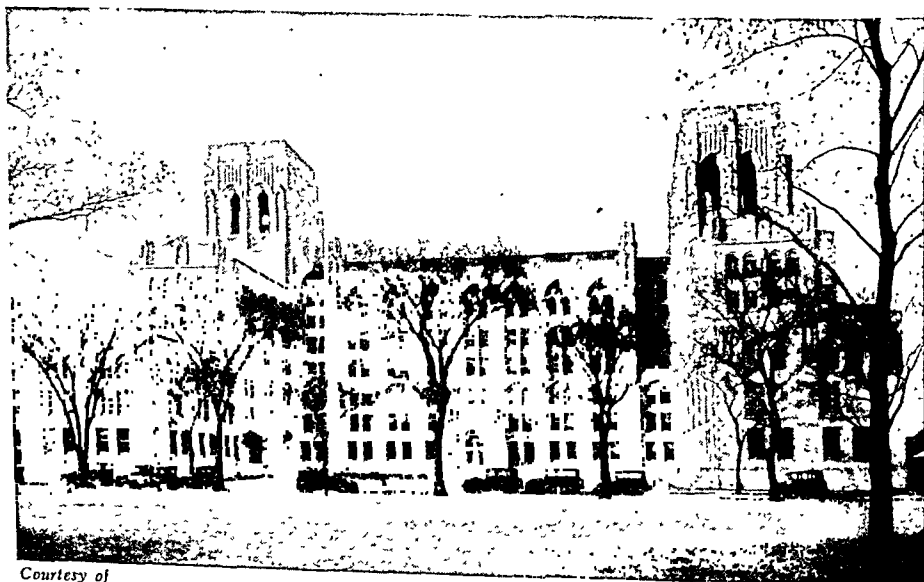
HOSPITAL FACILITIES IN CHICAGO

There are 135 hospitals of all types in greater Chicago, with a capacity of over 18,000 beds. About 80 per cent of these are operated for general hospital service. It is estimated that at the free

medical and dental clinics in Chicago more than 200,000 of the city's poor are treated annually.

Cook County Hospital, with 3,000 beds, is one of the largest general hospitals in the world. It is the center of Chicago's well known medical center on the near west side. Of the private hospitals St. Luke's with 650 beds is the largest. This hospital in 1927 admitted approximately 15,000 patients, of which 4,153 were qualified free cases. There were over 30,000 visits to its outpatient department. Other large hospitals in the city are Michael Reese, Presbyterian, and Mercy. The last named was established in 1849 and has been to Chicagoans all that its name implies.

The Municipal Tuberculosis Sanitarium is the largest public organization of its kind anywhere, devoted to the control of a single disease. It is located on a 160-acre tract in the northwest section of the city and has at the present time capacity for 1,225 patients. It has the most modern laboratory, hospital and surgical treatment. As a special feature it has a division devoted exclusively to



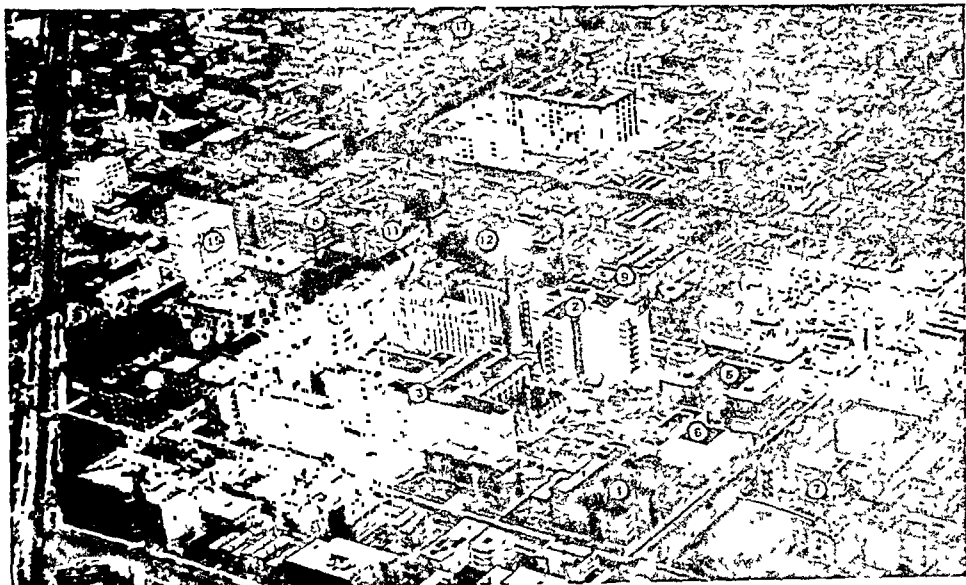
*Courtesy of
Kaufmann & Fabry Co.*

UNIVERSITY OF CHICAGO HOSPITAL

children suffering from tuberculosis. At its 8 dispensaries about 47,000 cases are registered for treatment at the present time, of which 3,000 are so-called open cases. The sanitarium has a staff of over

of the Health Department, is a 330-bed model isolation hospital with excellent equipment and doing a valuable health service.

The Chicago State Hospital for nerv-



Courtesy of Chicago Daily News and Aerial Photographic Service, Inc.

COOK COUNTY HOSPITAL AND THE GREAT WEST SIDE HOSPITAL GROUP

1. MAIN HOSPITAL BUILDING
2. NEW CHILDREN'S HOSPITAL
3. NEW MEN'S BUILDING
4. TUBERCULOSIS HOSPITAL
5. PSYCHOPATHIC HOSPITAL
6. NEW COUNTY MORGUE
7. UNIVERSITY OF ILLINOIS RESEARCH HOSPITAL
8. PRESBYTERIAN HOSPITAL
9. DURAND HOSPITAL

10. FRANCIS WILLARD HOSPITAL
11. RUSH MEDICAL COLLEGE
12. CHICAGO DENTAL COLLEGE
13. WEST SIDE HOSPITAL
14. UNIVERSITY OF ILLINOIS MEDICAL SCHOOL
15. WEST SIDE PROFESSIONAL SCHOOLS DEPARTMENT, Y. M. C. A.
16. PHILLIPSBOURN BUILDING
17. ASHLAND AUDITORIUM

1,100 employees and a revenue from taxation of about \$2,000,000 annually.

The Daily News Fresh Air Fund Sanitarium in Lincoln Park, where each year over 30,000 babies and about one-quarter as many mothers are treated, is a most interesting institution and worthy of study by all interested in child welfare work.

Of the strictly maternity hospitals, the Chicago Lying-In Hospital with its excellent facilities and dispensary service is the largest and probably best known in the city.

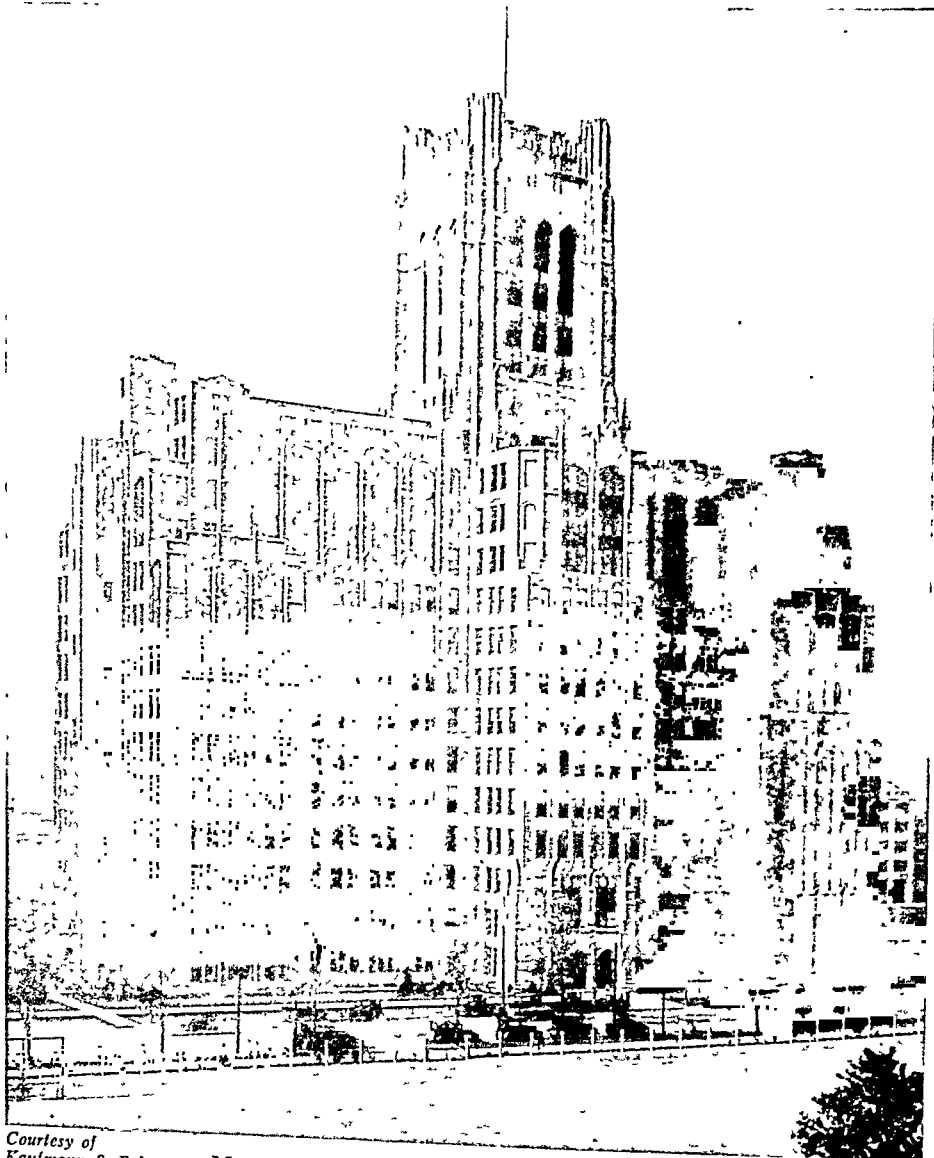
The Contagious Disease Hospital operated by the city under the supervision

ous and mental cases is operated by the State of Illinois. This is an institution which ranks among the best in America. It has about 3,000 beds.

The Illinois Central Hospital with 200-bed capacity is a splendid example of an industrial hospital.

MEDICAL RESEARCH

Some very important medical research work is being conducted in Chicago hospitals and institutions of learning. The famous discovery of the Dick test for scarlet fever susceptibility and a preventive antitoxin was made by Drs. George and Gladys Dick at the McCormick Institute of Infectious Diseases.



*Courtesy of
Kaufmann & Fabry Co.* MEDICAL-DENTAL BUILDING, NORTHWESTERN UNIVERSITY

At Cook County Hospital research work on diabetes, pernicious anemia, stomach ulcers, diseases of the heart, and the feeding of children were among the most important studies conducted last year.

In the investigative work of the scientific staff at the College of Medicine of the University of Illinois public health

problems and disease prevention are emphasized. In coöperation with the State Department of Public Health, the college staff is carrying out a series of highly important studies dealing with the adjustment of the normal body to climatic conditions; with the State Psychopathic Institute the research staff of the college has developed a new method

and treatment for tabes and paresis. The Research Laboratory has an animal hospital with complete surgical facilities, an art department for medical illustrations and a plastic studio for research workers and clinicians.

At the Chicago Lying-In Hospital extensive studies on embryology are being conducted. Valuable investigations of the use of X-ray diagnosis in obstetrics are being carried out at Northwestern.

Among the more important pieces of research being conducted at the University of Chicago Medical School are those on the metabolism of nervous tissue, infantile paralysis, the value of crystallized protein in tuberculin in combating tuberculosis, and the electrical measurement of the virility of pneumonia germs.

St. Luke's Hospital maintains a research laboratory where probably more research work is done than in any private hospital of like size in America.

DR. SCHMIDT, CHAIRMAN OF A. P. H. A. CHICAGO LOCAL COMMITTEE

THE acceptance by Louis E. Schmidt, M.D., F.A.C.S., of the chairmanship of the Local Committee for the Fifty-seventh Annual Meeting is highly gratifying to all. Dr. Schmidt has for many years been an active worker for the advancement of public health and is known as a man who does big things well. He has already effected an organization from among our Chicago and middle west members which assures us of a most successful meeting.

Dr. Schmidt is Senior Attending Urologist at St. Luke's Hospital; Professor of Genito-urinary Surgery, Northwestern University Medical School; President and Chief of Staff, Illinois Social Hygiene League; and Consulting Urologist for Michael Reese and Grant Hospitals. During Dr. Bundesen's administration as Health Commissioner for Chicago Dr. Schmidt was in charge of the Bureau of Social Hygiene and also served as a consultant for the department. He has taken active interest in all types of public health work, especially venereal diseases, tuberculosis and cancer, and has given freely of his time in advancing this work through legislation, organization and administration.

Dr. Schmidt has been a member of the American Public Health Association since 1923. He is also a member of the American Clinical Association



Moffet Studio

LOUIS E. SCHMIDT, M.D.

of Genito-Urinary Surgeons, American Urological Association and Chicago Urological Society, as well as International French and German Urological Associations.

Among those assisting Dr. Schmidt are: Arthur E. Gorman, Secretary, Isaac A. Abt, M.D., Volney S. Cheney, M.D., Thomas R. Crowder, M.D., Wm. A. Evans, M.D., Edwin O. Jordan, M.D., Arnold H. Kegel, M.D., Jacob M. Loeb, and Isaac H. Rawlings, M.D.

AMERICAN PUBLIC HEALTH ASSOCIATION

370 SEVENTH AVENUE, NEW YORK, N. Y.

COMMITTEES OF THE ASSOCIATION AND ITS SECTIONS, FOR THE ASSOCIATION YEAR 1927-1928

ASSOCIATION COMMITTEES

Committee on Administrative Practice

To study the administration of public health work, and to advise communities and public health organizations of the best methods for organizing and carrying on public health work in its several branches.

C.-E. A. Winslow, Dr.P.H., *Chairman* (1930), Yale University, New Haven, Conn.

Haven Emerson, M.D., *Vice-Chairman* (1930), 437 W. 59th St., New York, N. Y.

Louis I. Dublin, Ph.D., *Secretary* (1930), Metropolitan Life Ins. Company, New York, N. Y.

Michael M. Davis, Ph.D. (1931)

W. S. Rankin, M.D. (1931)

George D. Lummis, M.D. (1931)

George C. Ruhland, M.D. (1929)

Henry F. Vaughan, D.P.H. (1929)

Allen W. Freeman, M.D. (1929)

Charles V. Chapin, M.D. (1928)

W. F. Draper, M.D. (1928)

George T. Palmer, D.P.H. (1928)

A. J. Chesley, M.D. (1928)

C. Hampson Jones, M.D. (1928)

E. L. Bishop, M.D. (1928)

Homer N. Calver

Sub-Committees of Committee on Administrative Practice

Executive Committee

C.-E. A. Winslow, Dr.P.H., *Chairman*, Yale University, New Haven, Conn.

Louis I. Dublin, Ph.D., *Secretary*, Metropolitan Life Ins. Company, New York, N. Y.

Homer N. Calver

Record Forms

To devise standard record forms for the use of health departments, prepare the essential records only, and attempt to group these so that the facts can easily be taken from them for statistical purposes.

George C. Ruhland, M.D., *Chairman*, 419 City Hall, Syracuse, N. Y.

I. F. Thompson, M.D.

Ira V. Hiscock

George T. Palmer, D.P.H.

Walter M. Brunet, M.D.

Mary Brownell, R.N.

Merrill E. Champion, M.D.

Advisory Member

Jessamine Whitney

Industrial Health Service

To prepare a form for the collection of the essential data with respect to health conditions and health services of industries, and to keep in touch with progress in this field.

W. S. Rankin, M.D., *Chairman*, Johnston Bldg., Charlotte, N. C.

Leonard Greenburg, Ph.D., *Secretary*, Yale University, New Haven, Conn.

Lloyd Noland, M.D.

E. R. Hayhurst, M.D.

A. J. Lanza, M.D.

Public Health Nursing

To act in an advisory capacity on surveys and assist in formulating schedules for field studies and other record forms in which nursing service is involved.

Sophie C. Nelson, R.N., *Chairman*,

John Hancock Mutual Life Ins.
Company, Boston, Mass.

Mary Laird, R.N.

Amelia Grant, R.N.

Jane C. Allen, R.N.

Rural Health Work

To prepare the Appraisal Form for Rural Health Work and its revision, at stated intervals. It is also supervising and directing a study of rural health work, which will be made during 1928 and 1929.

E. L. Bishop, M.D., *Chairman*,
State Board of Health, Nashville,
Tenn.

S. W. Welch, M.D.

John A. Ferrell, M.D.

Huntington Williams, M.D.

Joseph W. Mountin, M.D.

George T. Palmer, D.P.H.

W. S. Leathers, M.D.

Appraisal Form for State Health Work

To prepare an Appraisal Form for State Health Work along lines similar to the Appraisal Forms for City and Rural Health Work.

W. F. Draper, M.D., *Chairman*,
U. S. Public Health Service,
Washington, D. C. (To coopt
members)

Revision of Appraisal Form for City Health Work

To revise the 1926 edition of the Appraisal Form and prepare the revised form for publication in 1929.

George T. Palmer, D.P.H., *Chairman*,
370 Seventh Ave., New
York, N. Y.

James Roberts, M.D.

Allen W. Freeman, M.D.

E. L. Bishop, M.D.

George D. Lummis, M.D.

Henry F. Vaughan, D.P.H.

Philip S. Platt, Ph.D.

Organized Care of the Sick

To define the problems and guide the scope and methods of survey, which include studies of hospitals and other

organized facilities for care of the sick.

Michael M. Davis, Ph.D., *Chairman*,
370 Seventh Ave., New York,
N. Y.

George C. Ruhland, M.D.

Haven Emerson, M.D.

D. L. Richardson, M.D.

W. S. Rankin, M.D.

Advisory Members

William G. Norton

W. C. Rucker, M.D.

Model Health Ordinances

To prepare for publication an outline for a model health ordinance for the use of health officers.

Henry F. Vaughan, D.P.H., *Chairman*,
Health Commissioner, De-
troit, Mich.

Haven Emerson, M.D.

E. L. Bishop, M.D.

Huntington Williams, M.D.

James A. Tobey, Dr.P.H.

Standard Health Department Reports

To prepare an outline for Annual Health Department Reports with suggested tables and forms for presenting other pertinent data.

C. Hampson Jones, M.D., *Chairman*,
Commissioner of Health,
Baltimore, Md.

Ira V. Hiscock

Committee on Cancer

To consider the subject of cancer from a public health viewpoint.

George A. Soper, Ph.D., *Chairman*,
25 West 43d St., New York,
N. Y.

George H. Bigelow, M.D.

Henry F. Vaughan, D.P.H.

Committee to Confer with American Medical Association

To confer on relationship of practice of medicine and public health work.

Herman N. Bundesen, M.D., Chi-
cago Sanitary District, 910 S.
Michigan Ave., Chicago, Ill.

Committee on Cleanliness and Health

To review the literature preparatory to planning future studies.

Ira V. Hiscock, *Chairman*, Yale University, New Haven, Conn.

F. P. Gorham

Edward S. Godfrey, Jr., M.D.

Committee on Census of Public Health Workers

To stimulate definitions of what constitutes public health workers and conduct a census of all workers who fall within the determined classifications.

John L. Rice, M.D., *Chairman*, Department of Health, New Haven, Conn.

John F. Norton, Ph.D.

Arthur E. Gorman

C. E. Turner

George H. Van Buren

Committee on Training and Personnel

To represent the Governing Council in the matter of public health education, and to make such recommendations as may appear pertinent to the interests intrusted to this committee.

C. E. Turner, *Chairman* (1930), Mass. Institute of Technology, Cambridge, Mass.

J. G. Fitzgerald, (1928)

W. H. Welch, M.D., (1929)

John Sundwall, M.D., (1931)

C.-E. A. Winslow, Dr.P.H., (1932)

Section Representatives:

John F. Norton, Ph.D.—*Laboratory*

Thomas F. Kenney, M.D.—*Health Officers*

W. J. V. Deacon, M.D.—*Vital Statistics*

Abel Wolman—*Public Health Engineering*

E. R. Hayhurst, M.D.—*Industrial Hygiene*

F. C. Blanck, Ph.D.—*Food, Drugs and Nutrition*

Walter S. Cornell, M.D.—*Child Hygiene*

E. G. Routzahn—*Public Health Education*

Gertrude Hodgman, R.N.—*Public Health Nursing*

Sub-Committee on Health Education in Colleges

John Sundwall, M.D., *Chairman*, University of Michigan, Ann Arbor, Mich.

M. P. Ravenel, M.D.

John W. Bowler, M.D.

Harold L. Lang

J. R. Earp, M.D.

H. G. Rowell, M.D.

Glenadine C. Snow, M.D.

Ethel Perrin

Lillian A. Hudson, R.N.

Sedgwick Memorial Medal Committee

To award annually for distinguished service a memorial medal commemorating Professor William T. Sedgwick.

M. J. Rosenau, M.D., *Chairman* (1930), 65 Naples Road, Coolidge Corner, Mass.

B. L. Arms, M.D. (1928)

Lee K. Frankel, Ph.D. (1928)

E. O. Jordan, Ph.D. (1929)

Robert Spurr Weston (1929)

M. P. Ravenel, M.D. (1931)

Charles V. Chapin, M.D. (1931)

Homer N. Calver, *Secretary* (1930), 370 Seventh Ave., New York, N. Y.

Committee on Eligibility

To recommend to the Governing Council the election of Honorary Fellows, applicants for Fellowship and of State Societies for affiliation, and to perform such other duties as may be assigned by the Governing Council.

Section Representatives:

Kenneth Allen (1928)—*Public Health Engineering*

C. E. Turner (1928)—*Child Hygiene*

Philip S. Platt, Ph.D. (1928)—*Public Health Education*

H. W. Redfield, Ph.D. (1929)—*Food, Drugs and Nutrition*

Wade Wright, M.D. (1929)—*Industrial Hygiene*

Frederick F. Russell, M.D. (1929)—*Laboratory*

W. J. V. Deacon, M.D. (1930)—*Vital Statistics*

F. J. Osborne (1930)—*Health Officers*

Alta E. Dines, R.N. (1930)—*Public Health Nursing*

Committee on Membership

To elect members, associate members and Sustaining Members.

(The Committee on Eligibility has been designated by the Executive Board as the Committee on Membership.)

Committee to Coöperate with Committees of the American Engineering Council and the American Society of Civil Engineers to Secure the Commissioning of Sanitary Engineers in the U. S. Public Health Service

George W. Fuller, *Chairman*, 170 Broadway, New York, N. Y.

George T. Palmer, D.P.H.

Sol Pincus

Haven Emerson, M.D.

Committee on Dairy Products

To develop a uniform and standard procedure for the necessary protection of public health in the production, processing and distribution of these commodities, and to develop in its work contact with all other agencies having similar aims.

Henry C. Sherman, *Chairman*, Columbia University, New York, N. Y.

William H. Park, M.D.

H. W. Redfield, Ph.D.

H. A. Whittaker

Isaac A. Abt, M.D.

William H. Welch, M.D.

Committee on Federal Health Legislation

To bring the matter of correlation to the attention of President Coolidge and appropriate committees of Congress, and to coöperate with other groups studying or promoting federal health correlation, and to represent the Association in all matters pertaining

to federal health legislation.

Lee K. Frankel, Ph.D., *Chairman*, Metropolitan Life Ins. Co., New York, N. Y.

James A. Tobey, Dr.P.H.

Milton J. Rosenau, M.D.

S. J. Crumbine, M.D.

S. W. Welch, M.D.

C. Hampson Jones, M.D.

Committee on Finance

To assist the Treasurer in an advisory capacity.

Louis I. Dublin, Ph.D., *Chairman*, Metropolitan Life Ins. Company, New York, N. Y.

George W. Fuller

Michael M. Davis, Ph.D.

Editorial Committee

To assist and advise the Managing Editor of *The American Journal of Public Health*.

M. P. Ravenel, M.D., *Chairman*, University of Missouri, Columbia, Mo.

C. C. Young, D.P.H.

Louis I. Dublin, Ph.D.

E. R. Hayhurst, M.D.

James A. Tobey, Dr.P.H.

E. G. Routzahn

C.-E. A. Winslow, Dr.P.H.

Walter S. Frisbie

Merrill E. Champion, M.D.

Henry F. Vaughan, D.P.H.

Sophie C. Nelson, R.N.

Arthur P. Miller

Committee on Journal Advertising

To advise the Managing Editor in the acceptance of advertising.

Alec Thomson, M.D., *Chairman*, 1313 Bedford Ave., Brooklyn, N. Y.

Sally Lucas Jean

Charles V. Craster, M.D.

Council on Standards

To act upon reports involving standards submitted to it by the Governing Council.

George W. Fuller, *Chairman* (1931), 170 Broadway, New York, N. Y.

Henry F. Vaughan, D.P.H., *Vice-Chairman* (1928), Commissioner of Health, Detroit, Mich.

Haven Emerson, M.D. (1929)

E. O. Jordan, Ph.D. (1930)

Merrill E. Champion, M.D. (1932)

Committee on Permanency of Tenure

To take an active part in changing the method of appointments of health officers and in securing for them permanency of tenure.

S. J. Crumbine, M.D.

Matthias Nicoll, Jr., M.D.

W. H. Howell, M.D.

John L. Rice, M.D.

Committee to Coöperate with Director of Census

To act as an advisory committee to coöperate with the Director of the Census in regard to vital statistics.

Charles V. Chapin, M.D., *Chairman*, Superintendent of Health, Providence, R. I.

Haven Emerson, M.D., *Secretary*, 437 W. 59th St., New York, N. Y.

Irving Fisher, Ph.D.

Committee on Ventilation

To study the relationship of ventilation to health, particularly in schools.

Louis I. Harris, M.D., *Chairman*, Commissioner of Health, New York, N. Y.

Thomas Duffield—*Public Health Engineering Section*

Joel I. Connolly—*Public Health Engineering Section*

Leonard Greenburg, Ph.D.—*Industrial Hygiene Section*

C.-E. A. Winslow, Dr.P.H.—*Industrial Hygiene Section*

S. Josephine Baker, M.D.—*Child Hygiene Section*

Charles H. Keene, M.D.—*Child Hygiene Section*

Committee on Chautauqua Health Program

To represent the Association in the organization of a rural health program in coöperation with Chautauqua sys-

tems, the Milbank Memorial Fund and others.

S. J. Crumbine, M.D., *Chairman*, 370 Seventh Ave., New York, N. Y.

H. E. Kleinschmidt, M.D.

Bertrand Brown

E. H. Marsh, M.D.

Donald B. Armstrong, M.D.

Temporary Organizing Committee for the West

To develop organization and to advise on problems particularly affecting the Western members of the A. P. H. A.

W. C. Hassler, M.D., *Chairman*, Department of Health, San Francisco, Calif.

E. T. Hanley, M.D., *Vice-Chairman*, 300 Public Safety Building, Seattle, Wash.

John J. Sippy, M.D., *Secretary*, Health Department, Stockton, Calif.

J. L. Pomeroy, M.D.

George Parrish, M.D.

Robert A. Peers, M.D.

H. B. Hommon

William P. Shepard, M.D.

H. E. Young, M.D.

F. D. Stricker, M.D.

W. F. Cogswell, M.D.

Advisory Member

James J. Waring, M.D.

Central Program Committee

To prepare programs for annual and other meetings of the Association and to establish standards for these programs.

Herman N. Bundesen, M.D., *President*, 910 S. Michigan Ave., Chicago, Ill.

Homer N. Calver, *Secretary*, 370 Seventh Ave., New York, N. Y.

Section Representatives:

C. C. Young, D.P.H.—*Laboratory*

C. Hampson Jones, M.D.—*Health Officers*

George H. Van Buren—*Vital Statistics*

Arthur E. Gorman—*Public Health Engineering*
 Eugene L. Fisk, M.D.—*Industrial Hygiene*
 J. H. Shrader, Ph.D.—*Food, Drugs and Nutrition*

H. H. Mitchell, M.D.—*Child Hygiene*
 Ira V. Hiscock—*Public Health Education*
 Mary Laird, R.N.—*Public Health Nursing*

SECTION COMMITTEES AND SECTION COUNCILS

The following is a list of the section committees. Where information has been supplied by the section secretaries an indication of the purpose of the committee is given.

HEALTH OFFICERS SECTION

Section Council

C. Hampson Jones, M.D., *Chairman*, Commissioner of Health, Baltimore, Md.

A. J. Chesley, M.D., *Vice-Chairman*, Old Capitol, St. Paul, Minn.

E. L. Bishop, M.D., *Secretary*, State Health Commissioner, Nashville, Tenn.

Alton S. Fell, M.D. (1928)

Louis I. Harris, M.D. (1928)

A. J. Douglas, M.D. (1928)

F. G. Curtis, M.D. (1929)

James Roberts, M.D. (1929)

H. L. Rockwood, M.D. (1929)

LABORATORY SECTION

Section Council

C. C. Young, D.P.H., *Chairman*, Department of Health Laboratory, Lansing, Mich.

W. H. Frost, M.D., *Vice-Chairman*, 615 N. Wolfe St., Baltimore, Md.

W. D. Stovall, M.D., *Secretary*, State Hygienic Laboratory, Madison, Wis.

Leonard M. Wachter (1928)

Friend Lee Mickle (1928)

E. Marion Wade (1929)

T. G. Hull (1929)

Committee on Standard Methods

E. O. Jordan, Ph.D., *Chairman* (1929), University of Chicago, Chicago, Ill.

John F. Norton, Ph.D., *Secretary*

(1929), University of Chicago, Chicago, Ill.

Norman MacL. Harris, M.B. (1929)

Roger G. Perkins, M.D. (1928)

William H. Park, M.D. (1928)

George W. McCoy, M.D. (1928)

W. H. Frost, M.D. (1930)

Leonard M. Wachter (1930)

Augustus B. Wadsworth, M.D. (1930)

Referees

A. M. Buswell, *Chemical Water Analysis*

Chester T. Butterfield, *Bacterial Water Analysis*

W. C. Purdy, *Microscopical Water Analysis*

Robert S. Breed, Ph.D., *Bacterial Milk Analysis*

F. P. Gorham, *Shellfish Analysis*

G. F. Reddish, Ph.D., *Methods for Testing Disinfectants*

T. R. Crowder, M.D., *Air Analysis*

W. A. Manheimer, *Bacterial Examination of Swimming Pools*

S. DeM. Gage, *Chemical Examination of Swimming Pools*

Anna W. Williams, M.D., *Diagnosis of Diphtheria—including virulence, intracutaneous tests, etc.*

Ruth Gilbert, M.D., *Wassermann Test*

Committee to Confer with A. P. H. A. Committee on Dairy Products

Robert S. Breed, Ph.D., *Chairman*, N. Y. Agricultural Experiment Station, Geneva, N. Y.

S. H. Ayers

W. D. Dotterer

Committee on Appraisal Form

Friend Lee Mickle, *Chairman*, State
Department of Health, Hartford,
Conn.

C. C. Young, D.P.H.

Ruth Gilbert, M.D.

Aubrey H. Straus

E. K. Kline, Dr.P.H.

Committee on Abstracts in the Journal

C. C. Young, D.P.H., *Chairman*,
Department of Health Labora-
tory, Lansing, Mich.

Ruth Gilbert, M.D.

I. S. Falk, Ph.D.

W. D. Dotterrer

Charles Krumwiede, Jr., M.D.

Committee on Program

C. C. Young, D.P.H., *Chairman*,
Department of Health Labora-
tory, Lansing, Mich.

W. D. Stovall, M.D.

Friend Lee Mickle

*Committee to Draw Up Curriculum in
the Education of Laboratory Workers*

C. C. Young, D.P.H., *Chairman*,
Department of Health Labora-
tory, Lansing, Mich.

W. R. Stokes, M.D.

T. G. Hull

VITAL STATISTICS SECTION

Section Council

George H. Van Buren, *Chairman*,
Metropolitan Life Ins. Company,
New York, N. Y.

F. M. Register, M.D., *Vice-Chair-
man*, Bureau of Vital Statistics,
Raleigh, N. C.

John O. Spain, *Secretary*, Bureau
of the Census, Washington, D. C.

E. S. MacPhail (1928)

W. A. Plecker, M.D. (1928)

Haven Emerson, M.D. (1929)

W. Thurber Fales, Sc.D. (1929)

*Committee on Forms and Methods of
Statistical Practice*

To suggest revised standard certi-
ficates of births and deaths for each
decade and outline a few standard
tables to promote uniformity in the

presentation of data.

William H. Davis, M.D., *Chairman*,
Bureau of the Census, Washing-
ton, D. C.

William H. Guilfooy, M.D.

Sheldon L. Howard

F. M. Register, M.D.

J. V. DePorte, Ph.D.

A. W. Hedrich

*Committee On Accuracy of Certified
Causes of Death and Its Relation to
Mortality Statistics and the Interna-
tional List*

To study the reliability of statements
of causes of death and make recom-
mendations concerning the decennial
revision of the International List.

Haven Emerson, M.D., *Chairman*,
437 West 59th St., New York,
N. Y.

William H. Guilfooy, M.D.

E. H. Lewinski-Corwin, Ph.D.

Louis I. Dublin, Ph.D.

Charles Norris, M.D.

William H. Davis, M.D.

George H. Van Buren

Wilmer R. Batt, M.D.

W. J. V. Deacon, M.D.

John O. Spain

Advisory Members

W. T. Longcope, M.D.

W. R. Williams, M.D.

Committee on Registration Affairs

To report on the progress made in the
registration of births and deaths.

William H. Davis, M.D., *Chairman*,
Bureau of the Census, Washing-
ton, D. C.

Carl F. Raver, M.D.

Stewart G. Thompson, D.P.H.

W. Thurber Fales, Sc.D.

A. A. Whittemore, M.D.

Committee on Public Health Climatology
To review studies of the influence of
climate on health and encourage in-
creased efforts in this field.

E. W. Kopf, *Chairman*, Metropoli-
tan Life Ins. Company, New
York, N. Y.

Kenneth Allen
 John S. Fulton, M.D.
 Lowell J. Reed, Ph.D.
 I. S. Falk, Ph.D.
Advisory Member
 R. B. Watson

Committee on Contributory Causes of Death

To analyze statistics on this subject and study methods in selecting the contributory cause in cases where three or more causes are reported on the same death certificate.

George H. Van Buren, *Chairman*,
 Metropolitan Life Ins. Company,
 New York, N. Y.

John O. Spain
 W. A. Plecker, M.D.
 John W. Trask, M.D.
 M. O. Heckard, M.D.
 Stewart G. Thompson, D.P.H.
Advisory Member
 Albert G. Love

Committee on Vital Statistics Training

To serve principally in an advisory capacity for any person seeking information regarding a course of instruction in vital statistics.

W. J. V. Deacon, M.D., *Chairman*,
 Dept. of Health, Lansing, Mich.
 Raymond Pearl, Ph.D.
 C.-E. A. Winslow, Dr.P.H.
 Edwin W. Kopf
 William H. Davis, M.D.
 James S. Elston

Committee to Aid Completion of Registration Area Before 1930

To make extensive efforts to improve the registration of births and deaths in states where the registration is not now up to the standard required for admission into the registration area.

Louis I. Dublin, Ph.D., *Chairman*,
 Metropolitan Life Ins. Company,
 New York, N. Y.
 Frederick L. Hoffman, LL.D.
 William H. Davis, M.D.
 Wilmer R. Batt, M.D.
 Blanche M. Haines, M.D.

R. C. Williams, M.D.
Advisory Members
 Jessamine S. Whitney
 W. R. Redden, M. D.
 George W. Ehler

Committee on Joint Causes of Death

To consider ways of improving and making more uniform the methods used in selecting one cause of death from a group of two or more causes reported on the same death certificate

William H. Davis, M.D., *Chairman*,
 Bureau of the Census, Wash-
 ington, D. C.

George H. Van Buren
 William H. Guilfooy, M.D.
 John O. Spain

Committee on Proper Allocation of Records

To consider the working out of a plan whereby births and deaths will be charged according to the usual place of abode instead of the place of birth or death.

J. V. DePorte, Ph.D., *Chairman*,
 N. Y. State Department of
 Health, Albany, N. Y.
 William H. Davis, M.D.
 Stewart G. Thompson, D.P.H.
 W. J. V. Deacon, M.D.
 Walter F. Willcox, Ph.D.
 William H. Guilfooy, M.D.
 George H. Van Buren

FOOD, DRUGS AND NUTRITION SECTION
Section Council

J. H. Shrader, Ph.D., *Chairman*,
 901 Municipal Building, Balti-
 more, Md.
 Henry C. Sherman, *Vice-Chairman*,
 Columbia University, New York,
 N. Y.
 Carl R. Fellers, Ph.D., *Acting Sec-*
retary, Massachusetts Agricul-
 tural College, Amherst, Mass.
 J. C. Geiger, M.D. (1928)
 Carl R. Fellers, Ph.D. (1928)
 Harry W. Redfield, Ph.D. (1929)

Committee on Beverages

All beverages except milk are con-

sidered as falling within the scope of this committee. Sanitation, adulteration, food value, container sterilization, and methods of manufacture and laboratory examination of beverages are considered.

T. J. King

M. J. Dooling, D.V.M.

Committee on Fruits, Vegetables and Their Products

Raw and preserved fruits and vegetables, as well as their products may properly be considered under this committee. The public health aspects of the production, transportation, marketing and consumption of raw, canned, dried or refrigerated fruits and vegetables are very important.

Henry M. Loomis, *Chairman*, 1739

H. St., Washington, D. C.

Carl R. Fellers, Ph.D.

Chester A. Darling, Ph.D.

Committee on Cereals and Their Products

The production, manufacture, distribution, food value, adulterations, bacteriological and chemical studies of cereals and such products as flour, starch, malted and prepared breakfast foods and their public health aspects are important.

F. C. Blanck, Ph.D., *Chairman*,
Bureau of Chemistry, Wash-
ington, D. C.

E. V. McCollum, Ph.D.

D. B. Jones, Ph.D.

Committee on Meat, Fish and Shellfish

The usual health aspects of meats, fish and shellfish, such as sanitation, disease transmission, purity, decomposition, food value and laboratory examination are of the greatest importance in the work of this committee.

Carl R. Fellers, Ph.D., *Chairman*,
Mass. Agricultural College, Am-
herst, Mass.

F. A. Korff

A. C. Hunter, Ph.D.

Committee on Dairy Products and Eggs
Milk, butter, ice cream, cheese, milk drinks, malted milk, evaporated and condensed milk, dried milk powders, baby preparations, shell eggs, frozen and desiccated eggs and all kinds of egg preparations properly come with-
in the scope of this committee.

Harry W. Redfield, Ph.D., *Chair-
man*, R. F. D. No. 1, Mendham,
N. J.

D. B. Peck, M.D.

E. M. Pickens, D.V.M.

Martin J. Prucha, Ph.D.

W. B. Palmer

W. H. Price, M.D.

Committee on Nutritional Problems

The food value, calorific, vitamin, and other basic studies on all kinds of foods; effect of adulterants, minerals, etc., on food value; nutritional diseases and metabolism disturbances are the problems of this committee.

Henry C. Sherman, *Chairman*,
Columbia University, New York,
N. Y.

E. L. Fisk, M.D.

D. B. Jones, Ph.D.

T. P. B. Jones

C.-E. A. Winslow, Dr.P.H.

PUBLIC HEALTH ENGINEERING SECTION
Section Council

Arthur E. Gorman, *Chairman*, 6743
Olympia Ave., Chicago, Ill.

Stephen DeM. Gage, *Vice-Chair-
man*, 310 State House, Provi-
dence, R. I.

George W. Putnam, *Secretary*, De-
partment of Health, Chicago, Ill.

Clarence M. Baker (1928)

Abel Wolman (1928)

Charles G. Hyde (1928)

E. Sherman Chase (1929)

J. F. Skinner (1929)

Committee on Scope and Policy

R. S. Weston, *Chairman* (1932),
14 Beacon St., Boston, Mass.

Earle Waterman (1928)

W. F. Wells (1929)

V. M. Ehlers (1930)

Abel Wolman (1931)

Committee on Committees

William H. Dittoe, *Chairman*,
(1932), Mahoning Valley Sanitary District, Youngstown, O.

Theodore J. LaFreniere (1928)

Charles G. Hyde (1929)

Langdon Pearse (1930)

H. E. Miller (1931)

Committee on Membership

Abel Wolman, *Chairman* (1932),
16 W. Saratoga St., Baltimore,
Md.

Carl Speer, Jr., *Secretary*, 7516
Colfax Ave., Chicago, Ill.

George W. Hazelhurst (1928)

Charles G. Hyde (1929)

George W. Fuller (1930)

Joseph W. Ellms (1931)

Committee on Bathing Places

Stephen DeM. Gage, *Chairman*,
310 State House, Providence, R. I.

Harry F. Ferguson

Jack J. Hinman, Jr.

George W. Simons, Jr.

E. S. Tisdale

Committee on Mosquito Control

L. E. Jackson, *Chairman*, 921 Ber-
gen Ave., Jersey City, N. J.

E. L. Filby

E. H. Gage

George H. Hazelhurst

A. E. Skinner

W. H. Van Hovenberg

Committee on Sewage Disposal

John F. Skinner, *Chairman*, 52
City Hall, Rochester, N. Y.

Frank Bachmann

C. K. Calvert

Harrison P. Eddy

C. P. Hoover

Langdon Pearse

Willem Rudolfs

Committee on Waterways Pollution

F. H. Waring

Ernest Boyce

A. L. Fales

J. K. Hoskins

William L. Stevenson

L. F. Warrick

A. H. Wieters

Committee on Water Supply

John R. Baylis, *Chairman*, 1643 E.
86th St., Chicago, Ill.

C. R. Cox

Joseph W. Ellms

C. A. Emerson, Jr.

Homer Knouse

W. H. Streeter

Committee on Rural Sanitation

A. Clinton Decker, *Chairman*, Ten-
nessee Coal, Iron & Railroad Co.,
Birmingham, Ala.

G. H. Ferguson

Paul S. Fox

Harry B. Hommon

W. Scott Johnson

Willard M. Olson

Harold A. Young

Committee on Refuse Collection and Disposal

Kenneth Allen, *Chairman*, Munici-
pal Bldg., New York, N. Y.

M. N. Baker

S. A. Greeley

C. A. Holmquist

W. T. Knowlton

E. D. Rich

L. E. Williams

Committee on Education and Training

Abel Wolman, *Chairman*, 16 W.
Saratoga St., Baltimore, Md.

Charles G. Hyde

W. C. Hoad

I. W. Mendelsohn

Arthur P. Miller

Ernest W. Steel

R. S. Weston

Committee on Milk Supply

H. A. Whittaker, *Chairman*, State
Board of Health, Minneapolis,
Minn.

Leslie W. Frank

C. A. Holmquist

R. E. Irwin

H. D. Pease, M.D.

George W. Putnam

INDUSTRIAL HYGIENE SECTION

Section Council

Eugene L. Fisk, M.D., *Chairman*,
25 W. 43d St., New York, N. Y.

Frank L. Rector, M.D., *Vice-Chairman*, 823 Case St., Evanston, Ill.

Emery R. Hayhurst, M.D., *Secretary*, Ohio State University, Columbus, O.

A. J. Lanza, M.D. (1928)

T. R. Crowder, M.D. (1928)

Volney S. Cheney, M.D. (1929)

Carey P. McCord, M.D. (1929)

George M. Price, M.D. (1929)

Elizabeth B. Bricker, M.D. (1929)

Committee on Industrial Anthrax

To keep close watch on human anthrax in America and report to the Section.

Henry F. Smyth, M.D., *Chairman*,
University of Pennsylvania, Philadelphia, Pa.

Volney S. Cheney, M.D.

S. Dana Hubbard, M.D.

Stanley H. Osborn, M.D.

Committee on Industrial Morbidity Statistics

To report at the Annual Meetings.

Wade Wright, M.D., *Chairman*,
Metropolitan Life Ins. Company,
New York, N. Y.

Frank L. Rector, M.D.

George H. Van Buren

Committee to Assist in Extension of Interstate Control of Poisons and Hazardous Substances Other Than Foods

Henry F. Smyth, M.D., *Chairman*,
University of Pennsylvania, Philadelphia, Pa.

Leonard Greenburg, Ph.D.

Frank L. Rector, M.D.

Committee on Standard Practices in the Problem of Compensation of Occupational Diseases

A. J. Lanza, M.D., *Chairman*, Metropolitan Life Ins. Company,
New York, N. Y.

Henry K. Kessler, M.D.

Bernard S. Coleman

George M. Price, M.D.

May R. Mayer, M.D.

Elizabeth B. Bricker, M.D.

R. R. Sayres, M.D.

E. R. Hayhurst, M.D.

J. G. Cunningham

Committee on Lead Poisoning

To report annually to the Section on the status and control of lead poisoning.

Carey P. McCord, M.D., *Chairman*, 62 Groton Bldg., Cincinnati, O.

Robert A. Kehoe, M.D.

Committee on Industrial Fatigue

To report at the Annual Meetings.

Eugene L. Fisk, M.D., *Chairman*,
25 West 43d St., New York, N. Y.

Wade Wright, M.D.

Derric C. Parmenter, M.D.

L. R. Thompson, M. D.

Frederick B. Flinn

E. R. Hayhurst, M.D.

Committee on Volatile Solvents

To report at the Annual Meetings.

Alice Hamilton, M.D., *Chairman*,
Harvard School of Public Health,
Boston, Mass.

Elizabeth B. Bricker, M.D.

Committee on Silicosis

To report at the Annual Meetings.

E. R. Sayres, M.D., *Chairman*, U. S. Bureau of Mines, Washington, D. C.

E. R. Hayhurst, M.D.

A. J. Lanza, M.D.

Committee on Skin Irritants

To report at the Annual Meetings.

Henry F. Smyth, M.D., *Chairman*,
University of Pennsylvania, Philadelphia, Pa.

CHILD HYGIENE SECTION

Section Council

Harold H. Mitchell, M.D., *Chairman*, 370 Seventh Ave., New York, N. Y.

J. H. Mason Knox, M.D., *Vice-Chairman*, 16 W. Saratoga St., Baltimore, Md.

Carl E. Buck, Dr.P.H., *Secretary*,
Dept. of Health, Detroit, Mich.

Sally Lucas Jean (1928)

Harold DeW. Cross, M.D. (1928)

Francis Hollingshead, M.D. (1928)

J. T. Phair, M.B. (1929)

Thomas A. Storey, M.D. (1929)

C. F. Wilinsky, M.D. (1929)

*Committee to Study and Report on the
Problem of Infant and Maternal Mor-
tality*

To study the various causes of infant
and maternal mortality, why these
causes exist and methods which may
tend to eliminate them.

Julius Levy, M.D., *Chairman*, 66
Baldwin Ave., Newark, N. J.

J. H. Mason Knox, M.D.

Blanche Haines, M.D.

Lee K. Frankel, Ph.D.

Lester Evans, M.D.

Miriam Ames, R.N.

Dorothy Holland, Ph.D.

Committee on School Health Problems

To deal with problems affecting school
health service which might arise dur-
ing the course of the year and demand
some expression of opinion from the
Child Hygiene Section.

Carl E. Buck, Dr.P.H., *Chairman*,
Dept. of Health, Detroit, Mich.

George P. Barth, M.D.

Harris R. C. Wilson, D.D.S.

Maud Brown

Mary S. Rose, Ph.D.

PUBLIC HEALTH EDUCATION SECTION

Section Council

Ira V. Hiscock, *Chairman*, Yale
University, New Haven, Conn.

Marjorie Delavan, *Vice-Chairman*,
State Department of Health, Lan-
sing, Mich.

John Sundwall, M.D., *Secretary*,
University of Michigan, Ann
Arbor, Mich.

Raymond S. Patterson, Ph.D. (1928)

Ira V. Hiscock (1928)

Ray H. Everett (1928)

Philip S. Platt, Ph.D. (1929)

Evart G. Routzahn (1929)

*Committee on Health Education, Insti-
tutes and Group Discussion*

Evart G. Routzahn, *Chairman*, 130
E. 22d St., New York, N. Y.

Raymond S. Patterson, Ph.D.

Iago Galdston, M.D.

Philip S. Platt, Ph.D.

Mary Swain Routzahn

Ira V. Hiscock

Committee on Appraisal Form

Philip S. Platt, Ph.D., *Chairman*,
N. Y. Tuberculosis & Health As-
sociation, New York, N. Y.

Evart G. Routzahn

Iago Galdston, M.D.

PUBLIC HEALTH NURSING SECTION

Section Council

Mary Laird, R.N., *Chairman*, 70 N.
Water St., Rochester, N. Y.

Elizabeth Stringer, R.N., *Vice-
Chairman*, 80 Schermerhorn St.,
Brooklyn, N. Y.

Margaret K. Stack, R.N., *Secretary*,
53 Imlay St., Hartford, Conn.

Sophie C. Nelson, R.N. (1928)

Anne L. Hansen, R.N. (1928)

Grace Ross, R.N. (1929)

Anne Ewing, R.N. (1929)

*Committee to Study Lay Committees
for Official Public Health Nursing
Organizations*

To study the usefulness, function,
constitution and appointment of Ad-
visory Committees on Public Health
Nursing, such committees to be ad-
visory to the Public Health authorities.

Health Officers' Section

F. X. Mahoney, M.D.

Henry F. Vaughan, D.P.H.

C. C. Slemmons, M.D.

Lay Members

Mrs. George C. Hunter

Mrs. Frederick S. Roth

James A. Tobey, Dr.P.H.

Nurse Members

Mrs. Elsbeth Vaughan

Mary S. Gardner

Elizabeth G. Fox, R.N.

ASSOCIATION NEWS

DR. GEIGER RETURNS TO CALIFORNIA

J. C. Geiger, M.D., formerly epidemiologist of the U. S. Public Health Service and Assistant Commissioner of Health in Chicago, Ill., has been appointed Associate Professor of Epidemiology in the University of California Medical School and Hooper Foundation for Medical Research. During 1913-1916 Dr. Geiger was epidemiologist for the California State Board of Health. While in Chicago, Dr. Geiger also served on the faculty of the University of Chicago.

Dr. Geiger is a Fellow of the A.P.H.A. and a member of the council of the Food, Drugs & Nutrition Section. He has made valuable contributions to the research field on botulism and food poisoning.

DR. WILINSKY HONORED

Friends of Dr. Charles F. Wilinsky gave a dinner in his honor in Boston, Mass., the evening of May 22. The occasion was Dr. Wilinsky's appointment as director of the new Beth Israel Hospital, Boston. He has taken a leave of absence from the Health Department where he has been serving as Deputy Health Commissioner, and he has resigned as president of the Boston Health League. Dr. Wilinsky is a Fellow of the A.P.H.A.

Dr. George Bigelow was a stimulating

and gracious toastmaster. Brief addresses were made by those who have been associated with Dr. Wilinsky in his work in the Health Department, the Health League, the Medical Society, and in the new hospital.

Ex-Mayor Curley on behalf of his friends, presented Dr. Wilinsky with a magnificent colonial clock.

DR. BINGHAM DIES

Arthur Wallace Bingham, M.D., president of the medical board of the Willard Parker Hospital, New York, N. Y. for the last 5 years, and since 1923 a member of the A.P.H.A. died June 10 at his home in New York City of heart disease after an illness of 3 months. Dr. Bingham was 55 years old. He was graduated from Yale University in the class of 1896 and later obtained his medical degree from the College of Physicians and Surgeons, Columbia University. For 10 years he was visiting surgeon to Willard Parker Hospital. Dr. Bingham received high commendation from the public health committee of the New York Academy of Medicine in its report of 1925 for his success in the care of contagious diseases. The May, 1927, issue of the *American Journal of Public Health* carried an article by Dr. Bingham, "Community Control of the Acute Infections," written in collaboration with Joseph J. Gallagher.

NEW MEMBERS

Selma I. Akerfelt, R.N., Fairfield, Conn., Supervisor Fairfield Visiting Nurse Association
James A. Bauman, Ph.G., Ridgewood, N. J., in charge of Ridgewood Analytical and Clinical Laboratory
Frederick J. Biele, C.E., Huntington, N. Y., Consulting Sanitary Engineer
Homer W. Borst, M.A., Indianapolis, Ind., Executive Secretary, Indianapolis Community Fund (Assoc.)

Philip Burgess, B.S., Columbus, O., Civil and Sanitary Engineer
Margaret Butler, R.N., Chicago, Ill., Superintendent of Nurses, Department of Health
Julia D. Clock, R.N., Howell, Mich., Livingston County Nurse
Samuel Cochran, M.D., Lawrenceville, N. J., Head of Medical Department, Lawrenceville School
Mary P. Connolly, Detroit, Mich., Supervisor

- of Health Education, Department of Health
Alma A. Dobbs, M.A., Los Angeles, Calif.,
Assistant Director Physical Education, Los
Angeles City Schools
- Eri M. Farr, M.D., Billings, Mont., Health
Officer, Yellowstone County
- William J. Fleming, M.D., Troy, N. Y., Health
Officer
- Joseph M. Ginsburg, Ph.D., New Brunswick,
N. J., Mosquito Control Work, Agricultural
Experiment Station
- John G. Graham, Accomac, Va., Sanitation
Officer, State Board of Health
- W. H. Gooch, M.D., Elmer, Mo., County
Health Commissioner
- Philip G. Hasell, B.S., Columbia, S. C., Sani-
tary Engineer, State Board of Health
- Melvin P. Hatcher, B.S., Kansas City, Mo.,
Sanitary Engineer with Burns and McDon-
nell Engineering Company
- Lee Swee Hock, M.S.D.S., Kuching, Sarawak,
Borneo, Senior Sanitary Inspector (Assoc.)
- Hou-Ki Hu, M.D., Shanghai, China, Commis-
sioner of Public Health (Assoc.)
- Alma I. Johnson, R.N., Orono, Me., Nurse,
University of Maine Health Service
- Richard H. Jones, B.S., Lansing, Mich., Wel-
fare and First Aid Work at the Novo Engine
Company (Assoc.)
- Peter Kasius, A.B., L.L.B., St. Louis, Mo., Ex-
ecutive Secretary, Missouri Social Hygiene
Association
- Clarence M. Keckler, B.S., Red Bank, N. J.,
Chemist and Bacteriologist, Monmouth Con-
solidated Water Company
- Chang-Sei Kim, M.D., Dr.P.H., Shanghai,
China, Field Director, Council on Health
Education (Assoc.)
- Adde C. Kimpton, Mexico, Mo. (Assoc.)
- W. G. Kirchoffer, Madison, Wis., Sanitary En-
gineer
- Pearl L. Laptad, R.N., St. Louis, Mo., Field
Nurse, American Red Cross
- Guy G. Lunsford, M.D., Ph.G., Cordele, Ga.,
Commissioner of Health, Crisp County
- Harry D. McBride, St. Louis, Mo., Vice Presi-
dent, St. Louis Tuberculosis and Health
Society (Assoc.)
- Francisco G. Moctezuma, Mexico, D.F., Mex.,
Sanitary Inspector, Public Health Dept.
- George I. Nelson, St. Louis, Mo. (Assoc.)
- Hibberd R. Norman, Norwich, Conn., Health
Officer, New London County
- Ardzroony Packchanian, New York, N. Y.,
Research Bacteriologist
- B. Ananthaswamy Rao, B.S., M.B., New York,
N. Y., Student at Harvard School of Public
Health (Assoc.)
- John C. Sager, B.S., Chicago, Ill., Junior En-
gineer, Sanitary District of Chicago
- Sara A. Scudder, New York, N. Y., Bacteriol-
ogist for Bellevue-Yorkville Health Demon-
stration
- Lon Sharp, Springfield, Mo., Commissioner
of Health and Sanitation
- William F. Sheehan, Williamsville, N. Y., Sani-
tary Engineer
- James W. Simmons, Cape Charles, Va., Sani-
tary Officer, Northampton County
- George R. Spalding, Oradell, N. J., Secretary,
Health Board
- E. B. Swerdfeger, M.D., Denver, Colo.
(Assoc.)
- William G. Taylor, Newark, N. J., Sanitary
Engineer
- Francis M. Veatch, B.S., C.E., Kansas City,
Mo., Designer of Water Purification and
Sewage Disposal Works
- Aurel Voina, M.D., Bucharest, Roumania, As-
sistant Director, Ministry of Health and
Public Welfare (Assoc.)
- John W. Waters, Cambridge, Mass., Director
of Physical Education, Y. M. C. A.
- James E. Williamson, South Orange, N. J.,
Designer and Builder of Water Purification
Works
- Luciele A. Withers, R.N., Las Vegas, Nev., for-
merly doing public health work in China,
and Nursing Representative for American
Red Cross
- Tillie Witt, R.N., Benton, Mo., County Public
Health Nurse
- Thomas F. Wolfe, Chicago, Ill., Research En-
gineer, Cast Iron Pipe Research Association
- James B. Woods, M.D., M.A., Smithfield, Va.,
Director Health Unit, Isle of Wight County
- Alexander H. Zimmerman, B.S., Chicago, Ill.,
Ventilation Engineer, Department of Health

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

Health Program Following Mississippi Flood—The total area affected in the spring of 1927 by the flood waters of the Mississippi and its tributaries represents 20,000 square miles inhabited by approximately 908,200 people. Emergency sanitation was provided by the American Red Cross in 149 concentration camps caring for 330,000 people. Assistance was rendered by the various state health departments, U. S. Public Health Service, the Rockefeller Foundation, and by neighboring states. It is estimated that in all the states in the flooded area 469,442 individuals were immunized against typhoid fever, receiving three inoculations, and 137,340 individuals were vaccinated against smallpox, before July 1, 1927.

During the spring and early summer of 1927 an effort was made to control malaria by means of screening the homes of malaria carriers. Nearly 7000 homes were screened in a period of approximately 90 days.

Since July, 1927, 78 counties have established health departments, and over 200 full-time health workers have been employed in such departments. Training schools were organized for the practical teaching of field public health work to prospective health officers, nurses and inspectors. The principal school was located at Indianola, Miss. The health program in each case was instituted along the same standard lines as enjoyed elsewhere.

The diseases which showed the greatest increase during the postflood period were pellagra and malaria. To combat the increase in pellagra dried brewer's yeast was distributed, and to control malaria the screening of homes occupied

by carriers was attempted, as was likewise, the free distribution of quinine.—J. G. Townsend, *The Full Time County Health Program Developed in the Mississippi Valley Following the Flood. Pub. Health, Rep.*, 43: 1199, (May 18), 1928.

Rabies Control in Kansas City—The Health Department in Kansas City, Mo., immunized, free of charge, from January 27, 1927, to April 1, 1928, 19,486 dogs. There were immunized by the veterinarians in this city, perhaps, 5,000 or 6,000 dogs. We have used the single injection method. Two hundred and eighty persons were given antirabic treatment in our clinic in 1925; 331 in 1926; 132 in 1927, and 12 the first 4 months of 1928. Our laboratory made the examination of 189 heads in 1926; 150 in 1927, and 5 in the first 4 months of 1928.

Our Department of Inspection and Sanitation, in coöperation with the laboratory and veterinary department, have recently completed a study or recheck and it is their opinion that the single injection is very successful and the cases of rabies developing in animals, after treatment, are practically unknown to this department. We have 2 reported cases, but in each of these cases the dog had been exposed before being given treatment.—Ernest W. Caviness, Personal communication, May 10, 1928.

Inoculation Against Diphtheria—The winter's epidemic of diphtheria in Paris has clearly shown the value of Ramon's anatoxin. This is obtained by heating diphtheria toxin and adding to it 40 per cent commercial formalin in the

proportion of 1 in 2000. Treated in this way the toxin becomes atoxic, while keeping its antigenic properties. Antitoxin is obtainable in boxes of three ampules each containing 2.0 c.c. the liquid being tinted green. Either two or three injections are given, the first being 0.5 c.c. and the second 1.0 c.c. given a fortnight after the first. In 87 per cent of cases the Schick reaction becomes negative after the second, which makes a third injection unnecessary; if required it is given after an interval of a week. In case of urgency it may be desirable to produce a passive immunity with purified serum.

Zoeller and Ramon now recommend vaccination via the nasal mucous membrane for patients who object to subcutaneous inoculation. Against diphtheria they protect the patient by instilling concentrated glycerinated antitoxin into the nose every second day. Two and sometimes three courses of treatment, lasting 6 days with intervals of a week to a fortnight between them, have proved sufficient to convert a positive into a negative Schick reaction. The method has the advantage of being easy to apply and of not provoking any vaccinal reaction, but it is less precise than subcutaneous inoculation and fairly large doses of antigen are required. Local vaccination is said to be as suc-

cessful in preventing dysentery, tetanus, and scarlet fever, as it is in the prophylaxis of diphtheria. Inoculation Against Diphtheria, *Lancet*, CCXIV: 1041 (May 19), 1928.

Serum Reactions—A study was made of a series of 237 patients with diphtheria and scarlet fever who received antitoxin at the Willard Parker Hospital, New York, N. Y. Of this number 171 were diphtheria cases and 66 were scarlet fever cases, and 164 gave a history of never having had any serum injections; while 45 had had a previous therapeutic dose, and 28 had been immunized with diphtheria toxin-antitoxin. Of those who had not had previous serum injections, 22 or 13.4 per cent, experienced a serum reaction. Of the 45 who had received antitoxin previous to the present illness, 8 or 17.8 per cent, had serum reactions. Of the 28 patients who gave a history of having been immunized against diphtheria, 4, or 14.3 per cent, gave serum reactions. These were all cases of scarlet fever. Previous administration of toxin-antitoxin appears to have little or no effect on subsequent serum treatment.—Sophie Spicer, The Effect of Previous Administration of Antitoxin and Toxin-Antitoxin on Serum Reaction, *J.A.M.A.*, 90: 1778 (June 2), 1928.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Relation of Atmospheric Humidity to the Deterioration of Evaporated Apples in Storage—The work recorded here was undertaken for the purpose of studying the effect of the humidity of the storage room on the keeping quality of dried fruits, in particular evaporated apples. Five well known varieties were collected having uniform moisture content. These were stored at temperatures of 20° to 30° C. (68° to 86° F.) under conditions of humidity varying from complete saturation to complete dryness. In all cases the fruit absorbed or gave up moisture until equilibrium with the surrounding air had been maintained. It was found that with relative humidities of 18.8 per cent or less the fruit retained the original color, odor and flavor throughout the entire storage period of three years. Relative humidities between 47 and 80.5 per cent resulted in brownish discoloration, rancid odor, and bitter flavor. These changes were evident within one year with fruit having a moisture content between 9 and 10 per cent. If it is assumed that these changes are the result of enzymic action, the enzymes are evidently not destroyed by treatment of the fruit with sulphur dioxide, sodium chloride or by heating to 80° C. before drying. Relative humidities higher than 80.5 per cent resulted in the rapid development of molds and yeasts sufficient to destroy the material within a few months. Treatment preliminary to drying, such as sulphur fumes, dipping in 2 per cent salt solution, or heating in steam to 80° C. did not eliminate discoloration at low humidities or the development of yeast and mold growth at higher humidities. It was also found that deterioration was

much more rapid in apples which contained highest acidity and lowest content of sugar. Fruit with a moisture content of 24 per cent (a maximum recognized by the U. S. Department of Agriculture for evaporated apples) is in approximate equilibrium with air having a relative humidity of 75 per cent at 30° C. (86° F.). Moisture is rapidly absorbed when the relative humidity rises beyond this point.—Charles W. Culpepper and Joseph S. Caldwell, *J. Agri. Res.*, 35:889 (Nov. 15), 1927.

Nutritional Anemia on Whole Milk Diets and Its Correction With the Ash of Beef Liver—Reference is made to an earlier article (*J. Biol. Chem.* 72:299, 1927) showing the correction by the addition of the ash of lettuce or cabbage of experimental anemia induced in rabbits by feeding whole milk—Fe₂O₃ diet. The present work records experiments using the ash of beef liver as the corrective. Rats of 50–60 g. in weight were placed on screens on a sole diet of whole milk until hemoglobin readings indicated that the animals were anemic. Since a whole milk diet results in depriving the animals of iron, a chemically pure solution of ferric chloride was made from standard iron wire and this was fed at a level of 0.5 mg. of Fe per animal per day without correcting anemia. Then beef liver and beef liver ash were tried. The former was dried at 65° C. for 67 days and then ground to powder which was fed by suspending it in whole milk and in amounts such as to introduce 0.5 mg. of iron, equivalent to that fed as FeCl₃. The ash of the liver was incinerated in a furnace at 650°–750° C., after which it was digested in

hydrochloric acid, diluted and filtered from insoluble residue. The filtrate, after concentration, was fed at a level of 0.5 mg. of iron daily and administered by stirring it into the milk. It was found that when iron in this amount obtained from liver was fed in either of the materials prepared prompt correction of anemia resulted and the hemoglobin was restored to normal, indicating that nutritional anemia of this type is due to an inorganic deficiency. A more detailed paper is to be prepared later.—J. Waddell, C. A. Elvehjem, H. Steenbock and E. B. Hart, *Science*, 67:139 (Feb. 3), 1928.

Vitamin A Deficiency and Urolithiasis—The author calls attention to the statement of Osborne and Mendel to the effect that out of 857 autopsies on rats on a vitamin A deficient diet they found calculi 81 times. McCollum and Simmonds found that calculi have occurred frequently in animals whose diets contained an abundance of vitamin A but were faulty in other respects and attributed the formation of calculi to general debility rather than to specific nutritional deficiency. These conclusions led the author to observe the rats in the laboratory of the Netherlands Institute of Nutrition as to the presence of calculi in the kidneys, the urinary tract and the bladder. The results of examination of 886 rats, 405 males and 481 females, are given. Among them were 241 which never suffered from vitamin A deficiency and in which no cases of calculi were recorded. The balance, 645 yielded 197 cases of calculi and these rats had been fed on vitamin A deficient rations as evidenced by chemical examinations. In addition to phosphate calculi were found those composed of calcium, ammonium magnesium phosphate and calcium oxalate, the latter occurring with McCollum's rachitogenic diet. It was observed that calculi on a vitamin A deficient diet formed rapidly, for example, after exper-

imental diets of 9 days, 12 days, 17 and 19 days, and 3 weeks the formation of calculi proved very common. The author concludes that there is a connection between vitamin A deficiency and the formation of phosphate calculi.—E. C. van Leersum, *J. Biol. Chem.*, 76:137 (Jan.), 1928.

Nature of the Protein Surrounding the Fat Globules in Milk—Details are given of the methods employed by the authors to determine the identity of the substance or hull surrounding the fat globules in milk. The result indicated a protein substance of rather constant composition having a low ash content and very closely related to, if not identical with casein. This relationship is supported by the determination of sulfur, phosphorus and tryptophane content of the hulls which agree almost exactly with the casein content of these substances. A significant difference between the character of the hull-protein and the casein is the lower solubility and the darkening of the hulls when dissolved in sodium hydroxide which indicates the possible contamination of the hulls with some unknown substance.—R. W. Titus, H. H. Sommer and E. B. Hart, *J. Biol. Chem.*, 76:237 (Jan.), 1928.

Antiricketic Substances. VII. Biochemical and Spectroscopic Studies on Purified Cholesterol—Work recorded here as a result of biological tests and the examination of absorption spectra led to the conclusion that the ergosterol-like substance in cholesterol which is readily activated is in fact ergosterol itself. A description is given of the Shipley line test and the position of the three absorption bands of cholesterol and ergosterol are confirmed—293.5, 282, and 270 mu. A fourth band common to each was discovered at 260 mu. Activation by ultra-violet rays was possible in the case of cholesterol specially treated with charcoal or bro-

mine for the removal of ergosterol. The activatability is due either to cholesterol itself or to an impurity persisting after three purifications with bromine. Details of the biological and spectroscopic technic are given, together with a plate showing the absorption spectra of cholesterol and ergosterol selected from 200 exposures.—Charles E. Bills and Edna M. Honeywell, *J. Biol. Chem.*, 76:251 (Jan.), 1928.

Vitamins in Canned Foods — Strawberries—Previous papers on this subject indicated that the chief factor in destroying vitamin C in the canning of foods is oxidation, and that after the preliminary destruction subsequent heating has little effect. Four experimental lots of strawberries were canned; stemmed strawberries being put into the cans filled with water boiled and subsequently cooled to 120° F. Cans were then exhausted at 190° F. for 12 minutes, closed, cooked in boiling water for 8 minutes and then cooled in cold water. The four lots, before processing, varied in temperature and the manner in which they were kept. These lots were tested for vitamin C content approximately 15 months after the date of canning. Growth curves of 3 guinea pigs are shown indicating the value as a source of vitamin C of canned tomatoes, raw strawberries and canned strawberries. It was found that strawberries are a rich source of vitamin C similar to tomatoes, furnishing a protection against scurvy in guinea pigs in daily amounts of 2 to 3 g. Canned strawberries, after having been canned a year had a similar vitamin C content to the fresh berries. The explanation ascribed is that strawberries contain considerable oxygen. Compared with tomatoes, strawberries are only about one-fortieth as rich in vitamin A and about one-fourth as rich in vitamin B.—E. F. Kohman, W. H. Eddy, and Nellie Halliday, *J. Indust. & Eng. Chem.*, 20:202 (Feb.), 1928.

Biological Values of Certain Types of Sea Food. II—Vitamins in Oysters—Vitamins A, B, and D in oysters were studied by feeding tests on albino rats. The oysters were obtained from Chesapeake Bay, ground while frozen and kept frozen during the period of experimentation. It was found necessary to feed in this form owing to the fact that experiments indicated that dehydrated fresh oysters had lost nearly all of the original vitamin B property and a very significant proportion of vitamin A during the dehydration which apparently also changed the chemical composition of the oysters. In the case of rats which had developed xerophthalmia, raw frozen oysters were fed at the 3.5, 2 and 1 g. level daily. The 3.5 g. level caused a growth response and the chart indicated that the 2 g. level is sufficient to cure xerophthalmia, although more slowly than the higher amount. The 1 g. level had little effect either on the growth or on curing xerophthalmia. The vitamin B content of frozen oysters was determined by curative and prophylactic methods and the feeding was conducted at 1, 2, 3.5 and 5 g. level daily. Five g. resulted in excellent and uniform growth rate but somewhat slower rate with the 3.5 portions, lower levels being inadequate to maintain weight. By the prophylactic method, the 5 g. level maintained a satisfactory growth rate for 60 days but failed to maintain it for a longer period. The animals suffered a rapid decline at the end of 12 weeks. This was shown to be due to insufficient vitamin B which affords a comparison of results obtained by the curative and prophylactic methods.

The "line test" method was used to determine vitamin D. Five g. of oysters daily for 10 days resulted in slight calcification comparable with that produced by 4 mg. of a good grade of cod liver oil. This daily quantity of oysters resulted in complete calcification in 20 days. Ground, dried oysters were

used in experiments to determine the presence of the reproductive factor. As a result of this investigation the oyster was found to be deficient in this respect.

The article contains a discussion as to the reasons for the destruction of vitamins A and B during dehydration which is ascribed either to bacterial or enzymic action during the time required, usually about 30 hours, or to the effect of traces of certain metallic elements since oysters are known to contain copper, lead, arsenic, and zinc.—D. Breese Jones, J. C. Murphy and E. M. Nelson, *J. Indust. & Eng. Chem.*, 20:205 (Feb.), 1928.

Growth-Promoting Value of Cod Liver Oil Irradiated by Sunlight and the Mercury Vapor Lamp—In order to obtain further evidence as to the possibility of increasing the antirachitic potency of cod liver oil, three groups of six young rats each were fed a basal rachitic ration supplemented by 1 per cent of Norwegian cod liver oil dissolved in 2 per cent of corn oil. The cod liver oil for one group had received no treatment, for another had been exposed to direct solar rays, and for a third had been irradiated with a mercury vapor lamp at a distance of 2 ft. for 20 minutes. Two other groups serving as controls received the basal ration alone, in one case untreated and in the other irradiated with a mercury vapor lamp in the same manner as the cod liver oil.

As judged by the growth of the different groups through the experimental period of 8 weeks, the irradiated cod

liver oil was no more effective than the untreated oil. That growth was a measure of antirachitic vitamin rather than vitamin A was thought to be demonstrated by the fact that the group receiving the irradiated basal ration made the greatest gains in growth.—A. L. Daniels and L. M. Brooks, *Proc. Soc. Exper. Biol. & Med.*, 24 9:971,972, 1927. Abstr., *Exper. Sta. Rec.*, 58:90 (Jan.), 1928.

Influence of the Age of a Milk, on the Result of Pasteurization—Cultures on gelatin and agar-agar were made of samples of fresh milk and of the same milks after sterilizing by heating for $\frac{1}{2}$ hr. at 62–63° F., followed by rapid cooling, and a comparison was made of the total number and of the relative proportions of the different kinds of bacteria in the fresh and sterilized milks. Similar tests were made on the milk after keeping for periods varying from 2 to 8 hrs. at temperatures from 8° to 30° F. The results show that the number of bacteria surviving pasteurization, as well as the percentage of these calculated on the total number present in the unpasteurized milk, are greater for the milks which have been kept for a time than for those which were sterilized at once in practice, it is therefore preferable to sterilize a milk as early as possible and then to keep it cool, rather than to keep it in cold storage and sterilize later.—A. Wolff, *Milch. Zentralb.* 11:233–238, 1927. Abstr. *Brit. Chem. Abstr.*—B, 47:33 (Jan. 6), 1928.

CHILD HYGIENE

MERRILL E. CHAMPION, M. D.

Progress Reports on Two Studies
—It cannot be denied that there is urgent need for more intensive studies of the principles on which public health is based. Consequently it is encouraging to follow the course of two such studies, preliminary reports of which will be briefly summarized below.

The first, entitled "Principles of Measurement Used in the School Health Study" is by Dr. Raymond Franzen, Research Director, School Health Study, American Child Health Association. Dr. Franzen first discusses observation and interpretation and points out that every judgment must have some kind of measurement as its basis and illustrates by three possible ways of estimating the nutritional status of a child:

1. A physician may consider various aspects of the child and come to a general rating which unconsciously summarizes all of his considerations.

2. The physician may estimate each of about fifty items, such as "subcutaneous tissue over the biceps," "subcutaneous tissue over the triceps," "size of calf muscles," and so forth, as being satisfactory or unsatisfactory, and then base his judgment upon a conscious summary of these estimates.

3. He may measure each of the items that he wishes to consider with some instruments like caliper and steel tape and then base his judgment upon the material secured by this investigation.

Passing to measures which have been used to evaluate school health experience, enumeration is made of three: First, available records; this is unsatisfactory on the score of inaccuracy and lack of adaptability. Second, rating scales and appraisal forms, is unsatisfactory as measuring practices and not results. The third consists of tests "constructed in order to achieve particular ends." Such tests must meet cer-

tain criteria: (1) different examiners must be able to obtain the same results with the same children; (2) "the items which together form a particular test should be alike in the essential we are measuring and different in all unimportant and chance ways"; (3) "each item of the test must have a known diagnostic emphasis"; and (4) "the quality measured must serve a useful purpose."

The second study is one carried on in Syracuse, N. Y., by the New York Commission on Ventilation during the school year 1926-27. The summary of results is given by Mr. Duffield under the title "Effects of Mechanical and National Ventilation on the Health of School Children."

Six schools were chosen—3 ventilated by modern mechanical methods and 3 by forty- and fifty-year old furnace-heated, naturally ventilated buildings.

Various records were kept: a temperature record; and an attendance and health record covering (a) the pupils on the active roll, (b) the pupils present, (c) the pupils present with respiratory illness, (d) the pupils absent with respiratory illness—the latter term including coryza, pharyngitis, tonsillitis, laryngitis, bronchitis, pneumonia, tuberculosis, grippe, etc.

Without going into details, which should be read in the original report, it may be sufficient to say that Duffield considers the "gross or crude results" of the study show: that the mechanically ventilated schools showed excesses of 47 per cent in total absenteeism, 67 per cent in absenteeism due to respiratory illness, of 80 per cent in the pupil sessions attended with respiratory illness; and of 77 per cent in respiratory illness among the pupils present and absent.

The summing up in the form of conclusions follows in the words of the writer of the paper:

If our original data had been based on the more reliable foundation of diagnosis of respiratory illness by competent persons, and had our follow-up of absentees been such as to preclude the possibility of falsification of cause of absence, and had the numbers of individuals included in our study been greater, we should be warranted in making the unqualified assertion of what this preliminary study strongly suggests, namely, that natural ventilation has some inherent virtue which mechanical ventilation does not possess, or that mechanical ventilation involves some harmful influence from which natural ventilation is free.

The high correlation between respiratory illness absenteeism in the mechanically ventilated schools and precipitation has been shown. For those interested in the mathematical relationship, it should be stated that with the seasonal trend of respiratory illness removed, the correlation ratio for the period February 4 to April 14 is $+0.82 \pm 10$, apparently both reliable and significant, whereas the corresponding figures for the naturally ventilated schools are $+0.35 \pm 0.27$, demonstrating no significant correlation.

It shall be our endeavor through further studies to remove the doubts that cloud the findings of this preliminary study and to demonstrate whether the high rate of air change is the causative agency in the excess of respiratory illness absenteeism in the mechanically ventilated schools.—

Raymond Franzen, Ph.D., *Child Health Bull.*, Jan., 1928; Thomas J. Duffield, reprinted from *J. Am. Soc. Heat. & Vent. Eng.*

Dental Prophylaxis—The January issue of the *Journal of the American Dental Association* includes a symposium of four papers by Drs. Quinby, Adair, Charters and Spalding on Dental Prophylaxis, presented at the Seventh International Dental Congress in 1926. Excerpts appear below:

It may be of interest to quote the opinions of a number of men recognized as leaders in the field of preventive dentistry:

It was because the profession did not clean teeth that the dental hygienist has come into existence. (T. P. Hyatt).

I have considered the future of the dental hygienist only in connection with the public schools Thus it seems that the public schools which reach all the children of all the people offer the largest contact with the public. It is safe to say that 90 per cent of all constructive health work for the future will be done through this agency.

From this conception of the interdependence of mouth health and general health . . . the field of the dental hygienist must be twofold:

First—There is the . . . prophylactic treatment and instruction in the hygiene of the mouth to aid in prevention of dental caries and gingivitis as far as it is possible, by cleanliness and artificial gum stimulation.

Second—There is educational service concerning these laws of general hygiene which promote the development and growth of a normal healthy body.

It is this work that must eventually influence the coming generation. Only through education can we hope to secure better teeth and a higher degree of immunity to dental disease. (A. C. Fones).

Conclusion: Periodic cleaning of the teeth is an important part of the program of preventive dentistry for both children and adults among the American population.

Gum massage is an important agency for the building of oral health.

The introduction of the child to dental service should be such as will enlist his coöperation.

All three of these things can be accomplished as well by the dental hygienist as by the dental practitioner, and at less expense to the community.—

The Dental Hygienist, E. Melville Quinby, D.M.D., *J. Am. Dental Assn.*, Jan., 1928.

Prophylaxis has been of such tremendous import and has given such far-reaching results that the work has spread and expanded until it is almost outside the dental ranks, and is almost as big as our profession itself.

The dental hygienists are conquering the children and grown people where we failed, but some of us will be laid on the shelf with the great dominating idea which has gripped the disciples of Smith, that prophylaxis is the greatest thing in dentistry and the best thing which could be done for the patient; that its proper application requires more skill and knowledge of conditions than any other branch, and it should, for this reason, be administered by the dentist himself.

Oral prophylaxis, as often practiced, is a complete and miserable failure. This declaration but analyzes the fact that, when properly practiced with a spirit of knowledge and

enthusiasm, it is the greatest success of all things yet embodied in our profession.

If we find a dentist with a dirty, stained set of teeth, and the same condition in his wife and children, he knows prophylaxis is a failure. If we find an office where no talk or demonstration on preventive dentistry is given the patients, or the dentist has a hygienist in a corner of his office, just for a side-show, we know that no interest in the subject exists here. If you see a dentist or hygienist who uses a pot of ordinary pumice with a dental engine, you will probably see why prophylaxis is a failure. If you see a dentist or hygienist who fails to teach oral hygiene facts to his patients, you will also view another failure.—

Oral Prophylaxis as Practiced—A Failure or Success? Robin Adair, D.D.S., *J. Am. Dental Assn.*, Jan., 1928.

Today, we are in an era of preventive dentistry, when the most important dental procedures are cleaning, and the use of methods planned to produce sound teeth and to save them, rather than to repair them or provide substitutes after irreparable damage. In such preventive work, I believe that we are beginning to appreciate what the toothbrush can do more than we have ever done in the past.

It is my opinion that more good can be accomplished by the dentists, in this present age at least, in teaching patients how to clean the oral cavity correctly, than dietitians can possibly accomplish in trying to regulate the diet to such an extent that the toothbrush will not have to be used nor will it be considered a necessity.

The attention of the patient should be called to the fact that there are five surfaces to every tooth that should be brushed, mesial, distal, occlusal, buccal and lingual. The average person brushes two surfaces, namely, the buccal and lingual, and firmly believes that he has done a perfect job, when in reality he has not even started. The majority of people have learned incorrectly how to brush their teeth through instructions from the platform and toothbrush drills, or by reading toothbrush or tooth paste advertisements.—

Immunizing Both Hard and Soft Mouth Tissue to Infection by Correct Stimulation with the Toothbrush, W. J. Charters, D.D.S., *J. Am. Dental Assn.*, Jan., 1928.

Cleaning Teeth, as such, by the dentist, having in mind as an objective, clean teeth only, is a menial task, unworthy the time of any refined or educated person, and for which there could be no commensurate compensation. However, if the process is a step in the

education of the patient in personal mouth hygiene, or in the establishment of oral health, or the treatment of oral disease, or for the sick, it assumes a different aspect, that of a dignified professional service. Repetition of this service is not justifiable after a state of health is once established. Everyone should do this work for himself, and patients ought to be impressed with their own obligations in this matter. Until we recognize these facts, we will always be looking for a way out of the task, being especially enthusiastic about passing the responsibility on to others.

If the individual dental hygienist is more interested and better qualified to impart knowledge concerning these subjects than the individual dentist, by all means allow her to do so, since thoroughness, a natural teaching ability and a broad training in psychology and hygiene are requisites.

The fundamental character of dental prophylaxis is made up of the following principles: It is inseparable from other branches of dentistry. Education in dental prophylactic measures is of prime importance. An operation on the teeth involves a consideration of the periodontium. The correction of incipient dental and periodontal lesions is essential. Thoroughness is indispensable. Perseverance is a requisite; as is also a consciousness of the truth of prevention in dentistry.—

The Fundamentals of Dental Prophylaxis, Grace Rogers Spalding, D.D.S., *J. Am. Dental Assn.*, Jan., 1928.

Maternal Damage—Dr. Louise McIlroy, Royal Free Hospital, London, in her address on Maternal Mortality, as reported in *National Health*, emphasized the much neglected topic of maternal damage from childbirth, claiming that maternal mortality figures could never be other than "misleading so long as no mention was made either of the women whose health was irretrievably ruined by childbearing or of those who died a few months after confinement from causes to which the conditions of labour had directly or indirectly contributed. What had to be considered was not merely whether the death rate rose or fell, but whether the damage rate was higher or lower as the years went by."

Maternal death is a tragedy always, but to send a mother home from the hospital broken in health, totally unable

to meet home conditions with any success, is surely almost equally serious.

Dr. McIlroy was very decided in her belief that needed dental attention should not be postponed until after confinement—both because of the “very definite danger of general toxemia arising from neglected teeth,” and because if left until confinement is over it is apt to be again neglected.

Pregnancy occurring in the tuberculous can rarely be allowed to continue in her opinion, because of rapid deterioration of health after confinement.

Cancer of the cervix was included among the dangerous conditions resulting from unskilled obstetrics. Statistics showed that cancer of the cervix was almost wholly confined to women who had borne children, though there were no figures available to show that the danger was increased by the number of pregnancies.—*National Health*, Jan., 1928.

Bacteriology of Dried Powdered Milk Preparations Used in Infant Feeding—It would seem that we have an undue feeling of security as to freedom from bacteria of dried powdered milk preparations.

The Dicks report an investigation undertaken in connection with a study of an epidemic of enteritis which occurred in an institution in which the infants received artificial feeding composed largely of dried protein milk.

The method of taking the cultures from the samples of the preparations of dried milk is given in detail.

A feeding prepared for one institution of protein milk contained 22,000 bacteria per c.c., of which 11,000 were green-producing streptococci.

In the feeding prepared in the other institution from protein milk there were 9,000 bacteria per c.c. with 7,000 green-producing streptococci.

The conclusions are that the methods of manufacture do not destroy the bacteria in the milk and that bacteria remain

viable in the product; also the preparation of the powdered milk feeding without boiling or pasteurization allows the bacteria in the product to persist in living form in the feeding.—George F. Dick, M.D., and Gladys H. Dick, M.D., *Am. J. Dis. Child.*, Dec., 1927.

Incidence of Tuberculosis Among New Zealand School Children—In 1926 a valuable investigation of the incidence of tuberculosis in 1,268 school children (ages 4 to 15 years) from country and town schools was undertaken in two districts in New Zealand. The objects of the piece of work were as follows:

1. To find the amount of tuberculosis occurring.
2. To learn what association exists between subnormal nutrition and latent tuberculosis.
3. To select groups of children requiring special provision.
4. To estimate the treatment necessary, either prophylactic or curative.

The children were given the Moro percutaneous tuberculin test. Positives were further investigated by means of the X-ray and chest examination by a specialist. Comparisons made with other data which are given in some detail “show the figures obtained to be trustworthy.”

There were 14.1 per cent who gave a positive reaction to the Moro test; 8.3 per cent of the European country children were positive as against 15.8 per cent in town children. The last showed marked difference also. Twenty-five per cent of the Maoris, all of whom lived in the country, gave a positive reaction apparently because of the close association with infected persons.

In the Wellington district the country children under 7 years were all negative, while 7.3 per cent of the town children under 7 years were positive. The influence of family history and exposure to infection, past history and environment were all gone into in considerable details.

"There was no indication of the influence of milk supply, about half the children having been supplied with pasteurised milk and half from private dairies."

As to nutrition, the positive and negative groups showed subnormal nutrition to be equal. Twenty-six per cent of the cases were 5 per cent or more below normal in each group but the positive group gave a slightly higher figure for superior nutrition—8.9 per cent whose nutrition was 10 per cent or more above normal. (The term "normal" was used rather than average in this connection.)

The parents of each positive child were personally interviewed and in those cases requiring treatment special lines of

treatment were laid down at a further interview.

Open-air régime, health camps, immunization by inunction with tuberculin ointment (already started in the Canterbury district) and ultra-violet light are recommended in appropriate cases.

Conclusions:

This work is yet in its infancy, but we have been able to select a group of children who will require watching until the age of twenty-five, and a smaller group requiring special care by the means most appropriate to the individual cases. This, if carried out more extensively in the future, should constitute a valuable means of prophylaxis, whereby the incidence of tuberculosis may be considerably lessened.—Mary Champtaloup, M.D., *Med. Off.*, Dec., 1927.

PUBLIC HEALTH NURSING

MIRIAM AMES, R. N.

New York State Public Health Nursing—Mathilde S. Kuhlman, R. N., says "coöperating with nurses of various charitable, industrial, and private organizations, the division of public health nursing gives the citizens the best of nursing care."

The public health nursing division in the state of New York in 1913 consisted of 4 nurses. It is now made up of a nurse director, assistant director, 63 supervising nurses, and an office force of 3 stenographers and 1 clerk. This expansion is commensurate with the increasing number of public health nurses in the state, there now being 1200 instead of the 135 in 1913.

Many of the public health nurses throughout the state are supported by funds from cities, towns, and counties under the health officers or boards of education. Every public health nurse employed from public funds must meet certain educational requirements. Each one must be a graduate nurse, not less than 21 years of age, registered by the

Board of Regents of the New York University, and shall have had a postgraduate course in public health nursing. To be in the state's service, she must also have had a year's experience in actual public health nursing. Civil service examination is required for county and state service and for some cities.

The state is divided into 15 sanitary districts, and a supervising nurse is assigned to each district to assist the nurses in that territory, and to know the nursing service in her district. Some of the remaining nurses connected with the State Department of Health are assigned to the various divisions for special work connected with these departments. Sheppard-Towner funds employ 8 full-time and 30 part-time nurses in 29 communities for maternity, infancy, and pre-school child work for a demonstration period.

An attempt is made to keep the state nurses and other public health nurses in public positions informed as to any new, approved methods of work. To this end

the staff nurses of the State Board of Health observe individually the work as it is carried on by such centers as the Maternity Center Association, the East Harlem Nursing and Health Demonstration, and others. Moreover, through federal funds the State Department of Health maintains a teaching center for maternity, infancy and child hygiene nursing. Nurses who are to take care of this work for the state must spend two or more weeks here for observation and training. (Other qualified public health nurses in or out of the state may avail themselves of this center.)

To help nurses to keep informed, there is a correspondence reading course, conducted by the New York University and the Bellevue Hospital Medical College. Each public health nurse is also provided with all the literature pertaining to maternal and child hygiene, communicable diseases, and social hygiene, published by these different departments.

To interest her still further in her chosen profession, there is held once each year a conference of health officers and public health nurses called by the State Health Commissioner. Needless to say, other conferences are held locally.

The incidence of poliomyelitis has given rise to special problems, that of caring for those unfortunate individuals afflicted by paralysis. For this purpose, the state has a staff of nurses under the direction of an orthopedic surgeon for follow-up work.

Not only does a close relationship and fine spirit of coöperation exist between the public health nurses employed by official agencies and the state Division of Public Health Nursing, but this is also found between the nurses employed by private organizations and the state. Thus, throughout all New York State, public health nurses work together to promote the health of the people.—Mathilde S. Kuhlman, "New York State

Public Health Nursing," *Nation's Health*, Nov., 1927. B. J. B.

New Social Hygiene Agency—
The importance of venereal disease is a public health problem of great magnitude. Too often voluntary agencies are handicapped by the absence of a specified local, social hygiene association to which to turn, and the result is that this phase of public health nursing is inadequately dealt with, or disregarded entirely. Health workers in New York City have been faced with situations where their health efforts would have been of more avail had there been such an association.

The adoption of a social hygiene program by the New York Tuberculosis and Health Association has been announced, with a statement of the proposed objectives. The objectives are summarized as follows:

To discover infected cases and keep them under qualified treatment by aiding physicians, clinics, hospitals, and institutional and social agencies, and by maintaining an information service to the public.

To discourage and prevent treatment by medical charlatans, druggists, and unqualified practitioners.

To support the health department in securing the reporting of venereal disease and data, in epidemiological studies, in studies of adequacy and distribution of facilities, and in securing adequate appropriations.

To promote health education in coöperation with sex educational agencies.

To supplement law enforcement agencies by advice and authoritative information.

Nurses who have been asking themselves how best to aid those working for the prevention and control of venereal diseases have here perfectly definite, clear-cut answers to their questions.—*J. Social Hyg.*, Nov., 1927.

The Thirteenth Annual Report—
One of the stabilizing forces in Public Health Nursing in the State of Massachusetts is the Association of Directors of Public Health Nursing Organizations. The thirteenth annual meeting was held in Boston, November 16, 1927, and ac-

According to the *Annual Report*, 71 organizations were represented by 251 board members, this being the largest attendance since the association was organized.

The developments of public health nursing in its relation to the duty of the board members and the recognition by board members for the opportunity for discussion and exchange of experiences, is a need which this association has tried to meet, both in county and annual meetings. Following the trend of the times, a committee was appointed by the Public Health Section, Massachusetts State Nurses Association, to meet with a similar committee appointed by the Massachusetts Association of Directors of Public Health Organizations, to consider ways and means of effecting closer relations and affiliations.

The Report of the Study of Child Welfare questionnaires for the entire state is included with brief statements of the subject matter dealt with by those who gave the addresses. The report may be obtained from Agnes T. Marvin, Secretary, Hingham, Mass.

NOTE: Similar organizations exist in a few other states. The value of such organizations to public health nursing is inestimable. We call attention to the fact that the invitation to the directors to participate in nursing activities came from the public health nurses of the state of Massachusetts.

The Types and Treatment of Heart Disease—As long as heart disease yearly exacts its toll, interest is naturally attracted to this subject. Samuel A. Levine, M. D., has made a valuable contribution to the literature on this subject.

Dr. Levine discusses briefly the various important types of heart disease; points out the essential differences between them; and mentions some of the principles of treatment. The important types of heart disease in the order of their development during life are congenital heart disease, rheumatic, thyroid, syphilitic, and degenerative or senile heart disease.

In congenital heart disease certain portions of the heart, or main blood vessels leading to it, may be incompletely or imperfectly formed. Some of the deformities may not cause any sign of heart disease. Again, they may cause dyspnea, spells of suffocation, weakness, or even poor mental or physical development. Little can be done to prevent or treat congenital heart disease. However, as such children are very susceptible to infections, they should be carefully guarded from exposure to infectious diseases.

The second type of heart disease results from rheumatic infections. This usually manifests itself by acute inflammatory rheumatism or Saint Vitus's dance. Sometimes the signs are not so noticeable, being only tonsillitis, sore throat, or the pains familiarly known as "growing pains." Acute inflammation of the heart may be the first symptom of heart disease. While damage to the heart does not always result from rheumatic infection, many times serious organic changes are produced. In many cases, the patient may recover from the infection with no apparent damage to the heart, but this may show itself twenty years or more afterwards.

There are two parts to the problem of the treatment of rheumatic heart disease.

1. The care of the acute attack of rheumatic infections.
2. Care where congestive heart failure occurs.

In the first case, the patient is kept in bed and the parts affected and the patient made as comfortable as possible. Some form of salicylates is generally given for the rheumatic pains. The treatment of the second class is mostly concerned with the proper administration of digitalis. Restful nights are necessary. When edema exists, it is well to start the patient on 200 c.c. of milk four times a day, which may be increased to a soft or semi-solid diet. The use of salt should be restricted. Ordinary nurs-

ing care is an important part of the treatment, as anything which aids in the diminution of the physical and mental burden of the patient aids his recovery.

Once the diagnosis of thyroid heart disease is made, a course of treatment follows which will prepare the patient for surgery. All the measures advocated for the treatment of heart failure should be applied with the addition of the administration of Lugol's solution.

Syphilis produces a certain type of heart disease. It usually affects the aortic valves causing aortic insufficiency. This results, usually, years after the initial infection. The outstanding feature of this disease is pain in the chest and also dyspnea. When this aortic type of patient shows heart failure, he is not able to live much longer than a year or two. Treatment is the same as that for any kind of heart failure with the addition of the measures which will treat the underlying disease, syphilis. Marked distress in breathing may be relieved by hypodermic injections of morphine or caffeine.

Degenerative or senile heart disease is the last to be considered. This is usually caused by the changes going on in the blood vessels. "When the arteriosclerosis is essentially limited to arteries, there results a condition called angina pectoris. When angina pectoris is not present, the generic term 'chronic myocarditis' is used to describe the condition." In cases of angina pectoris, death frequently takes place suddenly. However, this is not always the result. Treatment then depends upon the sever-

ity of the attack and the economic status of the patient. He is better off in bed for a month or so. Some form of nitrites or the inhalations of an amyl nitrite pearl should always be used for an attack. The patient should rest, particularly after meals.

In chronic myocarditis the heart gradually becomes inefficient. The strength of each beat is impaired. Dyspnea, edema of the organs, engorgement of the liver, and an accumulation of blood in different parts of the body develop. The patient should be kept in bed and the usual nursing care given.

Not much is known about the prevention of heart disease. Improved general nutrition will probably diminish the instance of rheumatic fever in the young. It would be well for children and adolescents to be over normal weight and for adults after 40 to be below normal weight.—The Types and Treatment of Heart Disease, Samuel A. Levine, M. D., *Am. J. Nurs.*, Nov., 1927. B. J. B.

State Aid for Connecticut Towns—Westbrook is the first town to start a new public health nursing service under the new state law which gives state aid in proportion to the amount of town tax receipts. Westbrook has appropriated its pro rata share for this service; a public health nurse has been appointed; and the work is now functioning.

The town of Cornwall has made application for the subsidy for public health nursing, its share having already been appropriated.—State of Connecticut *Health Bull.*, Nov., 1927.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

Talking and Planning for the Section—Members of the Section Council with other interested members of the Public Health Education Section gathered in New York for a day and a half in February. Plans were laid for the Chicago program and exhibits, and for other section activities. All present were enthusiastic over the value of talking over program possibilities and plans for extending the services of the section. It is hoped to hold such a conference every year.

Public Health Education Institutes—The Section Council agreed to conduct a limited number of one- or two-day institutes or conferences. These might be held under the auspices of state health organizations or by university extension departments. A moderate fee will be charged to secure regular attendance and to reduce the expense to the sponsoring body. Invitations to hold institutes should be addressed to the chairman, Professor Ira V. Hiscock, Yale University, New Haven, Conn.

Talking It Over Among Yourselves—The round tables being conducted by the New York Committee on Publicity Methods (see *A. J. P. H.* Feb., 1928, p. 242) have been so interesting and practical that we hope health workers in different cities will adopt the idea. And at least one such session might be held in connection with any state meeting of health workers. Details will be supplied by Evart G. Routzahn, 130 East 22d St., New York, N. Y.

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

"Media of Publicity" for Medical Societies—The following were offered by Dr. Frank C. Hammon, Chairman, Committee on Lay Education, Medical Society of Pennsylvania: "Newspapers (distributed direct and through syndicates and county societies; magazines, distributed through agencies or direct); labor organizations; fraternal organizations; ministerial organizations; men's clubs and service organizations; women's clubs; churches, radio; movies; stores, libraries; schools and colleges; trolley cards; industrial corporations; coöperation with insurance companies; inauguration of 'Health Week' by county medical societies; health-examination clinics in connection with 'Health Week'; county fairs and other exhibits; state farm show; coöperation with Anti-tuberculosis Association, welfare federations, cancer and heart associations, and any health organization; coöperation with state, county, and city health departments; coöperation with nurses, druggists, and dentists' associations; inauguration by county societies of permanent health-examination clinics; coöperation with hospitals and hospital associations." —*Atlantic M. J.*, Aug., 1927.

Education Against Cancer—"Not only must the laity and the medical profession be educated, but dentists and nurses must be informed of what they should know," says *Campaign Notes*, American Society for the Control of Cancer, 25 West 43d St., New York, N. Y., Jan., 1928. Under "Suggestions for a State Campaign for the Control of Cancer," the following methods are listed: "For the public: newspaper articles and editorials; lectures; moving

pictures; exhibits; radio talks; pamphlets, posters and booklets; personal instruction of patients by physicians, dentists and nurses; clinics. For the medical profession: papers read before meetings of societies; lectures by speakers from a distance; conference of members of hospital staffs; clinics; pamphlets, reprints, etc." *Free*.

Small Type in Books—"Is there any way of 'getting under' or making war against publishers who produce books with small type? As a seller of books for boys and girls, I have been literally bombarded with complaints from customers about them. Many refuse to consider books with excellent material just because of poor print. . . . The printers of such books are not only defeating their own purposes as to sales, but they are sacrificing the eyes of boys, girls, and grown-ups."—Letter from Bookshop for Boys and Girls, Boston, in *Saturday Review of Literature*.

Write protests to publishers of books issued in too small type. Get material for a press story (or suggest the idea to a local editor) by interviewing book sellers as to the relative saleability of books in small type. Use large type in your own leaflets and booklets.

Education in a Measles Epidemic—Observations in the midst of measles epidemics in a number of cities prompted the following educational or publicity suggestions:

Enlightening information as to the nature of measles, reasons for changing former regulations, etc., should be given out and the responsibility of the public in the prevention of deaths made clear.

What may be expected of the health department by way of help—such as free medical attention if the family cannot afford a physician, visiting nursing service, and hospital facilities—should also be publicly known.

If any foreign newspapers are available they should be used freely.

A special effort should be made to reach

parents of preschool children through educational visits and by pamphlets.

—Measles a Community Emergency, by Bee S. Hoiles. *Pub. Health Nurse*. Feb., 1928.

Social Hygiene Workers Believe in Education—"How much of the budget ought to go into educational measures? In the association budget for the last two years it has been about three-eighths. Anything up to 100 per cent was the consensus of opinion."—*Social Hygiene News* (Jan. 30, 1928) reporting some of the practical questions discussed at the annual meeting of the American Social Hygiene Association.

Health Propaganda in France—"With the assistance of the voluntary national health organizations a general propaganda committee was formed" by the Office National d'Hygiene Sociale. "This committee has endeavoured to organize a vast campaign of popular education throughout the country, through the press, posters, pamphlets, tracts, wireless talks, films, lectures, etc. It has also been active among large bodies of workers such as railway employees, the merchant marine and present and future teachers. In 28 departments it has carried on intensive campaigns in the form of Health Weeks and Health Fortnights, has supported health organizations and in a general way has contributed to the development of public health services or associations.

"One point which deserves special mention is the organization during the past year of a nation-wide propaganda campaign against venereal diseases, the results of which have been most satisfactory. . . . The Office has completely fused the various activities in the field of health education, which have hitherto lacked unity. Thanks to universal propaganda and to concentration on certain activities, the General Propaganda Committee has succeeded in awakening

a health intelligence among the public, thus advancing the cause of public health."—*World's Health*, 2 Avenue Velasquez, Paris, France, Jan., 1928. With reproductions of six French health posters strikingly different from any produced west of the Atlantic.

Why Do They Get Diphtheria in Detroit?—As is true everywhere because they lacked protection. In an attempt to learn why they were not protected the Detroit Department of Health

... made a study of 100 recent cases of diphtheria, the results of which are given below. Inasmuch as practically all the cases were among children, the question, as to why toxin-antitoxin had not been given, was answered by the parents.

In 45 cases toxin-antitoxin had not been given because of plain neglect—putting it off—on the part of the parents. In 14 instances parents had never heard of toxin-antitoxin. In 9 instances the parents did not believe in toxin-antitoxin. In 9 cases parents stated that the child had never been ill and that they thought it was not necessary to give toxin-antitoxin to a child who had never been ill. In 9 cases either the parent or the child was afraid that the giving of toxin-antitoxin might cause a little pain, that is, that it would hurt. In 6 instances the mother said that she did not have the time nor facilities for taking her children to a physician or clinic. In 3 cases the parent did not think it was necessary to have a child of preschool age protected against diphtheria.

There were the reasons given in 95 per cent of the cases studied. The remaining 5 did not have toxin-antitoxin because the child had been sick a great deal and the parents were afraid to have toxin-antitoxin given; the parents did not believe that toxin-antitoxin and vaccination against smallpox should be given in the same year, and as the child had just been vaccinated they were waiting until the following year to give diphtheria immunization; and because another child in the family had had a severe reaction and the mother was therefore unwilling to have the second child immunized.

Here are real ideas for the Detroit health workers to meet in their educational publicity. Would not such a study be worth while in other communities?

STATISTICS

Bar charts versus circle diagrams is discussed in the *Journal* of the American Statistical Association (Columbia University, New York, N. Y.) in the issues of June, 1926; March, 1927; and Dec., 1927. The last is devoted solely to "accuracy of judgment," disregarding "popularity and appeal," and other points. The conclusions do not seem to be sufficiently convincing to be quoted.

The not altogether convincing estimates of the economic waste through deaths by tuberculosis are improved on in *Health-grams*, Illinois Dept. of Public Health. Feb. 15, 1928. Free.

Snap, zip, vigor or kick may get into a diagram of statistical data after reading "Add a Picture to Your Sales Curve," by E. P. Hermann. *The Poster*, 307 South Green St., Chicago, Ill., Oct., 1927. 22 illus. 30 cents. (If it does not "take" with you, mail the copy you buy to the editor and he will buy it from you and refund the 30 cents.) *We wish to exhibit specimens of picture diagrams or diagrams with pictures at Chicago in 1928.*

RADIO

A series of radio talks has been given during the past two months by Dr. George K. Pratt and other members of the National Committee on Mental Hygiene staff on the subject of "Why Men Fail," from Station WEAf. The talks were based upon a series of articles under this general title which appeared in the *New York Herald Tribune* and twenty other newspapers.

What does this mean? The opening paragraph of a radio talk: "It is the general opinion of scientists that cancer is at first a local disease. Something goes wrong with the regulating mechanism of the body and as a result the unwholesome persistent growth begins and once begun it cannot stop itself, but must be removed or destroyed." *Will someone re-write this for the radio audience?*

MOTION PICTURES

The Connecticut State Department of Health now offers 43 health films "covering almost every phase of health. These include science films all of which are valuable for use in the upper grades and in high schools, there are many popular films suitable for showing in public moving picture houses, some of which can compete easily with the best in the 'movies.'"—List *free*.

Pictures on child welfare, general hygiene, tuberculosis, malaria and sex education are supplied by the League of Red Cross Societies, 2 Avenue Velasquez, Paris, France. Catalogue *free*.

The series of motion pictures being produced for the American College of surgeons by the Eastman Kodak Co. are outlined in *The Motion Picture*, 469 Fifth Ave., New York, N. Y. No. 10. *Free*.

"Teaching with Motion Pictures in Nursing Schools and Hospitals," by Priscilla Bernard. *Trained Nurse*, 468 Fourth Ave., New York, N. Y. Oct., 1927. 35 cents.

LISTS

"Directory of State and Insular Health Officers, 1927." *Public Health Reports*, U. S. Public Health Service. Nov. 11, 1927. 5 cents, from Superintendent of Documents, Washington. Includes main budget items, and publications issued.

EXHIBITS

Small cut-out photographs, 6, 8 or 10 inches high, have been effective for window display or exhibit use. In Toledo the Community Chest placed groups of 8 inch figures in an open-front box or theatre 16 by 26 inches, and 6 inches deep. By having the mounting and cutting done by the children of one of the member agencies the cost was but a few cents for each figure.

"A Museum Illustrating Welfare Work for Cripples in Germany," by Dr.

Hellmut Eckhardt. *World's Health*, Nov., 1927.

"What a Health Department Could Do for Suffolk County" was graphically sketched in attractive colors at the Suffolk County (N. Y.) Fair on a map 3 by 6 feet. Reproduced in *S. C. A. A. News*, 105 East 22d St., New York, N. Y., Oct., 1927. *Free*. They hid the modest 20 cents per capita in small letters in a corner! Why not at the top: "for only 20 cents per capita," or "What Two Dimes Apiece Would Do for Suffolk County Citizens."

HONORABLE MENTION

International Health Board: for an illustrated, readable, comprehensive, condensed annual report, with table of contents and index (the latter, unfortunately, with legibility lessened by the use of capital letters).

PUBLIC SPEAKING

Audiences totaling 250,000 were reached in 1927 by 1,125 lectures given through the American Social Hygiene Association.

Whom Shall we Have as Speaker? Council of Social Agencies, 312 West 9th St., Cincinnati. 30 pages. 4 cents for postage. Suggestive where health and social agencies are planning a common speakers' service. Health topics are grouped as "general" on group and community health problems and needs, and "instructive" on how to preserve health and prevent disease. Then there are talks on child health and mental hygiene.

POPULAR HEALTH ARTICLES

"Food, the New Medicine," by E. R. Stevenson. *High School Service*, American National Red Cross, Washington. Dec., 1927. 15 cents. Vitamins simplified.

"For Longer and Healthier Lives." *Literary Digest*. Jan. 28, 1928.

"How's Your Cold?" by Ruth F. Wadsworth, M.D., *Collier's*, New York,

N. Y. Jan. 28, 1928. "The prevalence of the common cold is an indictment of our civilization." Good popular booklet copy. Read to see how the subject *can* be made readable.

among the reviews in *World's Health*, 2 Avenue Velasquez, Paris, France, seems too small. Scientific and popular books, reports of demonstrations, and reports of special studies would be welcomed by the editor.

OFFICE

Many hints, helps and hunches on office practice are to be found in "Over My Desk," a monthly page conducted by Elwood Street in *The Survey*.

Minor distinction through postage stamps: In place of a one and a half cent stamp use three half cent stamps; again place the three stamps end for end instead of side by side; watch for the special commemorative stamps sold from time to time—sometimes one must send to one of a few post offices to which the sale is limited.

"The magazines (received at national headquarters of the American Red Cross) will be routed to anyone wishing to see them regularly." Are the professional periodicals and other helpful publications routed to all members of our staff who might be interested? Have we ever sent to all staff members a list of the periodicals received regularly? Do we list periodicals received in a department or by an individual staff member who would be willing to loan them to others?

"Personal" on letters may be unfortunate if not used with discretion. A Philadelphia publishing house is unwise enough to add "personal" to the address on envelopes containing book circulars.

OPPORTUNITIES

Five posters were reproduced in *The Poster*, 307 South Green St., Chicago, Ill. Nov., 1927, from a heart poster contest conducted by the Tuberculosis Society of Detroit, Mich. *The Poster* editor will welcome advance information and photographs of the prize winners from other competitions.

* The proportion of public health books from the United States and Canada

REGRETTABLE

That the interesting health reading in the *Monthly Bulletin* (Galveston) is always *after* the uninteresting though significant statistical material which is given the choice first pages in every issue.

That one city health department has been written 3 times (without results) suggesting that the street number be added to the address of the monthly bulletin sent to a reader in New York City. Every month, without the street address, the bulletin must be passed on to a post office worker who looks up that street address.

AWARDS

Awards for good publicity will be made by the Committee on Publicity Methods at Memphis, May 2, 1928. The conditions for entering examples in Newspaper Publicity, Letters, Folders and Booklets are supplied by the Committee at 130 East 22d Street, New York, N. Y. Material issued since March, 1927, may be entered.

Somewhat similar awards may be made by the Public Health Education Section of the A. P. H. A. at Chicago in October, 1928.

The awards in both groups of contests will be made for specific good features: for the lead of an article, for the cover of a report, etc.

TITLES

"Conquerable—But Unconquered."—*Weekly Health Review*, Racine. Diphtheria.

"Where Do You Suppose I Could Have Caught It?"—*Weekly Health Review*, Racine.

LAW AND LEGISLATION

JAMES A. TOBEY, LL. B., DR. P. H.

Surgeon General Cumming Reappointed—Appointment of Dr. Hugh S. Cumming for his third term as Surgeon General of the U. S. Public Health Service was confirmed by the Senate on January 27, 1928. Dr. Cumming became Surgeon General in 1920, succeeding Dr. Rupert Blue.

Progress on the Parker Bill—At the hearings on H.R. 5766, the Parker Bill for coördination of federal health activities, held by the subcommittee of the House Committee on Interstate and Foreign Commerce on January 11 and 12, 1928, considerable opposition was expressed to the first and second sections of this measure. These important sections would empower the President to transfer executive bureaus doing health work to the U. S. Public Health Service by executive order, or direct that scientific personnel of the U. S. Public Health Service be detailed to other bureaus to assist or supervise public health activities. The opposition came from agricultural and dairy interests, who seem to feel that the U. S. Public Health Service already has too much power and would get too much more by the passage of such a law. A new bill, H.R. 11026, has been introduced in place of H.R. 5766 and this new one, with the former first section deleted, was reported to the House on February 21, 1928.

While the remainder of this bill contains many important matters, the first two sections were the ones which would really bring about the necessary correlation of federal health work, which sanitarians have been urging for half a century or more.

Milk Import Act in Force—Funds made available by the First Deficiency Act, signed by the President on December 22, 1927, have made possible the enforcement of the Federal Import Milk Act, which became a law on May 15, 1927. The Food, Drug and Insecticide Administration of the Department of Agriculture has organized a staff and arranged to issue the permanent permits required. Since the passage of this law, milk and cream have been coming into the United States under more than 3,800 temporary permits. The Canadian authorities are coöperating by conducting tuberculin tests and making sanitary inspections of dairies in the Dominion. Our government has placed an inspection service at Rouses Point in New York and will establish other stations.

An investigation into the costs of production of milk and cream was ordered by the U. S. Tariff Commission on March 4, 1926, and hearings were scheduled for this purpose, beginning February 23, 1928.

An appropriation of \$10,000 for expenses of an American delegation of ten to attend the Eighth International Dairy Congress in London next July was voted in the House on January 26, 1928, and in the Senate on February 21.

Amendments to the Sanitary Code of New York with reference to milk are given in *Health News* of that state for January 2, 1928.

Federal Subsidies for Rural Health—A million dollars a year from the national treasury for rural hygiene—This is the object of a bill, H.R. 7005, introduced in Congress by Representative Bankhead of Alabama, and referred

to the Committee on Interstate and Foreign Commerce. This same measure, which is similar in principle to the so-called Sheppard-Towner Law, has been before the last two or three Congresses, but so far without action. The U. S. Public Health Service is designated as the executive agency to administer the act and to approve state plans for rural hygiene. Federal grants would be made only to those states accepting the act and matching the federal money with a state appropriation.

An Emergency Fund—Another million would be appropriated by the national government as an emergency fund to cope with unusual perils to the public health, according to S. 2691, introduced in the Senate by Dr. Cope. This bill recites that it shall be the duty of the Surgeon General to present to the President any situation where there is great and imminent peril to the public health by reason of impending pestilence, and if the President is convinced of its existence, the Surgeon General would be directed to take such measures and incur such expenditures, in coöperation with state health authorities, as might be necessary.

To Make May Day Official—May Day would be officially designated as national child health day by a joint resolution, H.J. Res. 184, entered in the House by Representative Greenwood of Indiana, and in the Senate by Mr. Barkley as S.J. Res. 89.

Other Bills Before Congress—Hearings on a bill to grant \$50,000 toward the maintenance of the Gorgas Memorial Institute in Panama were held on January 20, 1928, before the Judiciary Committee of the House. A resolution (H.J. Res. 175) has been introduced to change the name of the Ancon Hospital in the Canal Zone to the General Gorgas Hospital and this was

referred to the Committee on Military Affairs of the House. An appropriation of \$310,000 for construction at Walter Reed Hospital in the District of Columbia is provided by H.R. 9676, passed by the House on January 26. The measure (H.R. 5658) to allow the rank and pay of a colonel in the Medical Corps of the Army came up in the House on January 16, 1928, but was passed over on objection by Mr. Blanton. A bill (H.R. 10078) to strengthen the immigration laws provides for deportation of aliens who violate the white slave and narcotic laws. There are several bills for a federal department of education (H.R. 7, H.R. 5693, H.R. 5790, S. 1584). The Department of Agriculture would be enriched and probably enlivened by a Federal Alcoholic Liquor Board, according to H.R. 8131. There are a number of bills to regulate chiropractic, osteopathy, and other cults in the District of Columbia.

The Message of Governor Smith—More than half of the famous 100-page message transmitted by Governor Alfred E. Smith to the Legislature of New York on January 4, 1928 is concerned with public welfare. Health comes in for a fair share of comment, for, says Governor Smith, "Proper attention to the preservation of the public health will produce a strong, healthy, vigorous people. There is no greater state asset." He then goes on to say that there is abundant reason to be well pleased with progress in this field in New York during the past ten years, and he proceeds to outline some of the activities of the Department of Health.

With respect to the Federal Maternity and Infancy Law, the Governor says, "Although upon questions of political principle there existed considerable opposition to the state taking advantage of the federal government offer of funds under the Maternity and Infancy Aid

Act, the state adopted a wise course and allowed the political debate to be carried on in its proper place, but meanwhile made provision to meet the contributions of the federal government for maternity and infancy care."

After discussing the Physically Handicapped Children's Law, by which judges of the Children's Court are authorized to issue orders covering the physical care and treatment and the education of physically handicapped children, the Governor devotes some attention to public health nursing. "One of the most important factors in health work is the public health nurse," he says, pointing out that there has been an increase from 500 such nurses in the state ten years ago to 1200 today.

The importance of the county health law, which was passed in 1921, is stressed in the message: "Our knowledge of preventive medicine has reached the point where for best results its administration should be in the hands of a qualified full-time expert in this field." Although towns and villages can seldom afford such service, only one county has taken advantage of it, and the Governor rightfully believes that New York is laggard in this respect.

Much attention is devoted in the message to the Mental Hygiene Department. There is also considerable discussion of the workmen's compensation law, in connection with which it is pointed out that provision has been made for compensation for 23 distinct forms of occupational diseases.

Among the 29 recommendations, are several affecting public health. These include suggestions for extension of the Physically Handicapped Children's Law to cover physical handicaps other than orthopedic defects; establishment of a minimum wage board to study the problem of wages paid to women; provision for compensation for all occupational diseases arising out of and in the course

of employment; and increased facilities for after-care.

From the standpoint of public health, this document from the pen of Governor Smith has all the marks of statesmanship.

State Health Laws in 1926— Approximately 110 new laws and 60 regulations pertaining to public health were passed and adopted during 1926, according to William Fowler, LL.B., whose latest compilation of *State Health Laws* has just been issued by the U. S. Public Health Service as *Supplement No. 65*. Mr. Fowler has listed for us some of the subjects treated by these new laws. Tuberculosis hospitals, water and sewage, and health authorities seem to have been the favorite health legislative topics during 1926, while shellfish control, camp sanitation, and communicable disease control induced most of the new regulations. Unlike some years in the past, there was very little on the venereal diseases in 1926, though two states, Connecticut and Illinois, adopted regulations on this subject. An interesting law was one passed in Louisiana placing a tax on kerosene to raise funds for various public health purposes. Only one state, Rhode Island, had a new law dealing with milk, though four states adopted regulations concerning this product. A law relative to cancer, providing for a state program, was passed in Massachusetts. These annual compilations of state health laws have been issued since 1911 by the U. S. Public Health Service and are useful bulletins, especially for sanitarians interested in the laws of states other than their own.

Proposal to License Health Officers—Examinations and licenses for health officers are now required by law in only one state, New Jersey, though this method of attempting to secure well qualified health officials has been much

discussed by sanitarians during the past few years. Recently there has been introduced in the Massachusetts Legislature a bill to provide for the licensing of local health officers. This measure has been carefully drafted and is a good example of a concise, yet complete, bill and one which contains a proper delegation of authority. This bill is, in fact, so important that it is herewith presented in full.

Section 1. On and after one year from the date of passage of this act no person shall be appointed as a local health officer, or as an executive or agent of the board of health of any town or city having a population of more than ten thousand or as the executive officer or agent of any group of towns having a combined population of more than ten thousand unless he has been licensed as a health officer by the State Department of Public Health.

Section 2. A license as a health officer shall be issued by the State Department of Public Health to each person who passes an examination in the following subjects: communicable disease control, epidemiology, public health laboratory methods, personal hygiene, municipal sanitation, water supply and waste disposal, control of milk and other food supplies, vital statistics, and sanitary law.

Section 3. The State Commissioner of Public Health shall appoint a board of not more than five well qualified persons to act as examiners of applicants for licenses as health officers. Such examinations shall be held at such times and in such places as the Commissioner shall determine. Such examinations shall be conducted in accordance with rules made by the State Department of Public Health.

Section 4. This act shall not prevent any local board of health from continuing in office, without examination and license, any health officer or agent who fills such office at the time of passage of this act.

Section 5. A fee of . . . shall be paid to the State Department of Public Health by the applicant for each examination taken for a license as health officer.

Health and Mental Responsibility
—Attempts to set up mental irresponsibility as an excuse for all behavior not in accordance with accepted standards were strongly decried in a radio talk recently delivered by Dr. Frederick W. Parsons, Commissioner of the Depart-

ment of Mental Hygiene of New York. Some of these unscrupulous attempts were characterized as disgraceful by Dr. Parsons, who also stated that such methods caused public suspicion of the integrity of the medical and legal professions. It is, of course, proper that persons who are actually sick mentally and who do not understand the nature of the acts should not be held responsible for crimes and should be placed in suitable institutions, but attempts to secure their freedom because of alleged "brainstorms," "twilight states," and "emotional insanities," are "insults to group intelligence," according to Dr. Parsons.

Along these lines, it is interesting to note that a bill (H.R. 177) has been introduced in Congress for a laboratory in the U. S. Public Health Service to study the abnormal classes. Bills have also been introduced (S.2684, H.R. 9762) to regulate the commitment to and discharge from St. Elizabeths, the Government Hospital for the Insane, of persons certified by heads of departments. On January 13, 1928, St. Elizabeths and its superintendent underwent an attack by Representative Blanton. An appropriation for this institution was, however, adopted by the House.

Patents and Public Health—Several items of patent law having some effect on public health have recently been decided in the federal courts and the Patent Office. Thus, patents have been granted for a milk bottle having a neck with internal ribs and without the usual annular flange (Patent No. 1654365); and for an improvement on a process of obtaining "vitamins" (No. 1649520). A patent for a laxative chewing gum containing phenolphthalein has been held invalid by the Circuit Court of Appeals of the Second Circuit in *Health Products Corp. v. Ex-Lax Mfg. Co.*, because there was no disclosure of the actual commercial practice.

The most important of these decisions on patents has to do with an invention made by a chemist of the U. S. Public Health Service while he was in the government employ. The United States was held to be the equitable owner and entitled to assignment of this patent, in the case of *Houghton v. United States*, decided recently by the Circuit Court of Appeals for the Fourth Circuit. While on government duty Houghton conducted experiments on fumigants and developed an improved type which combined a warning or irritant gas with hydrocyanic acid gas. Contrary to the wishes of his employer, the U. S. Public Health Service, he obtained a patent, which was, however, disallowed by the Federal District Court of Maryland after the United States had brought suit. On January 10, 1928, this decision was upheld on appeal to the Circuit Court.

Miscellaneous—An osteopath cannot be appointed as a school medical inspector in New Jersey, according to a decision of the State Education Com-

mission, reported in the *New York Herald Tribune* for January 27, 1928.

Changes and additions to workmen's compensation laws in the states made during 1927 are outlined in the *Monthly Labor Review* of the U. S. Bureau of Labor Statistics for January, 1928.

Death due to actinomycosis has been held to come under the workmen's compensation law of Wisconsin in *Pfister and Vogel Leather Co. v. Industrial Commission*, 215 N. W. 815.

An exhibit for the International Exposition at Seville, Spain, to be held next October, is being prepared by the U. S. Public Health Service.

The U. S. Women's Bureau has issued a pamphlet (*Folder 5*) describing its activities. This bureau has prepared 4 bulletins on health problems of women.

The appendix of the *Congressional Record* for January 18, 1928, is embellished with a rather extensive article on the peril of narcotic drugs, by Richmond P. Hobson. It was placed there at the request of the Hon. Hugo L. Black of Alabama.

CONFERENCES

April 12-14, American Society of Biological Chemists, Inc., Ann Arbor, Mich.

April 12-14, Federation of American Societies for Experimental Biology, Ann Arbor, Mich.

April 28, National Research Council, Washington, D. C.

April 30-May 2, American Pediatric Society, Washington, D. C.

April 30-May 2, National Probation Association, Memphis, Tenn.

April 30-May 5, National Congress of Parents and Teachers, Cleveland, O.

May 1-2, American Association of Pathologists and Bacteriologists, Washington, D. C.

May 2-9, American Association for Organizing Family Social Work, Memphis, Tenn.

May 7-10, National Conference on City Planning, Dallas, Tex.

May 10-12, American Association of Hospital Workers, Memphis, Tenn.

May 23, American Climatological and Clinical Association, Washington, D. C.

May 23-26, American Physical Education Association, Baltimore, Md.

May 28-June 2, American Library Association, West Baden, Ind.

May 28-June 7, General Federation of Women's Clubs, San Antonio, Tex.

July 8-12, Congrès International de la Protection l'Enfance, Paris, France.

July 8-13, First World Congress of Social Workers, Paris, France.

July 16-21, Thirty-ninth Congress Royal Sanitary Institute, Plymouth, England.

BOOKS AND REPORTS

Dictionary of Bacteriological Equivalents, *French-English, German-English, Italian-English, Spanish-English*—By William Partridge, F. I. C., Baltimore: Williams & Wilkins, 1927. 141 pp. Price, \$4.00.

The author has produced a book which may have certain uses, is well printed and very free from errors.

While the majority of the words included are used in bacteriology, there are many which do not belong to that science especially, and many more which the veriest tyro in science would understand without having to look them up in a special book. Others which need definition are omitted. Why, for instance, is the French word for otitis, the meaning of which is evident to everybody, given, while the word for mumps, which only those familiar with French know, left out? Surely mumps is discussed in bacteriological works as well as otitis. Many similar examples could be cited. There are numerous chemical and medical terms which are more used in ordinary medicine than in bacteriology. The definition for the word "témoin" is given as "control experiment," though it is applied to animals as often as to other control work.

It seems a waste of space to give the English equivalents of such words as camera lucida, carbonate, colon, eczema, ether, fungus, menthol, mucus, nickel, nitrate, peptone, pepsine, quinine, virus, and many others which are the same in English, and which any first course medical student would understand.

It would be more useful to give the equivalents in the different languages for the same set of words. In the book before us there are 2400 French, 2600 German, 1200 Italian and 1600 Spanish

words. French and German are more read than Italian and Spanish, but, by the same token, are more familiar and need less explanation.

M. P. RAVENEL

Diseases of the Mouth—By Sterling V. Mead, D.D.S. 274 ill. and 29 col. pl. St. Louis: Mosby, 1927. Price \$10.00.

We have with approval repeatedly called attention to the growing recognition of the importance of oral hygiene as a matter of public health. Only recently a well written book has classed it among the three great advances made within the last ten or fifteen years. With this we are inclined to agree. Consequently we always receive a book on oral hygiene with more than ordinary pleasure, especially if, like the present one, it is good. We believe that physicians generally are too much inclined to regard dentistry as a specialty, in which they have no concern, and to neglect the hygiene of the mouth, which is only incidentally connected with dental work, and which has a much wider bearing than the actual filling of teeth, or the correction of dental deformities.

The present volume is designed primarily for students. It begins very properly with methods of examination of the mouth and with certain general principles involved in diagnosis, which are of as much value to the average physician as they are to the dentist who does the practical work.

Living in Washington, as the author does, he has had exceptional advantages in ability to consult with prominent men in some of our services, as well as access to the Surgeon's Library, which is generally considered the best medical library

in our country, and one of the best in the world.

The author goes much further than average writers on oral hygiene. Not only does he consider the malformations and diseases which concern the teeth, the alveolar structures, the gums, the tongue, lips, related glands and accessory sinuses, but goes into such conditions as syphilis, diseases of the blood and blood vessels, nerves, etc. One chapter is devoted to the relation of oral sepsis to systematic disturbances concerning which the physician of today is so painfully aware, and about which we are all so eagerly seeking information.

We think the author has made a mistake in substituting rather jaw-breaking scientific names for some well known terms. "Pyorrhea alveolaris" is given to us under the name of "suppurative periodontoclasia," and one discovers this only in the index.

The book is beautifully gotten up, and abundantly illustrated with 274 excellent illustrations, most of which are photographs, and 29 plates in colors, all of which are well done. It is printed on the heavy paper of which our American publishers seem to be so unfortunately fond. On this account, the reading of the book is a burden, and one could very well knock an ox down with it.

M. P. RAVENEL

Subject Matter in Health Education—By *Ruth Strang, Ph.D.* *Contributions to Education, No. 222.* New York: Bureau of Publications, Teachers College, Columbia University. 1926. 108 pp. Price, \$1.50.

This book presents the results of a statistical investigation of health education in the United States as recorded in representative courses of study of 11 cities, 3 rural communities, 4 states, and in 14 selected texts. Some 43 of the 108 pages in the book are devoted to tables. Following these an evaluation is made of the usefulness

and scientific accuracy of the material review.

The author finds that numerous of the statements which occur commonly in courses of study and texts must be classed as of the undesirable type: because they are indefinite, (Drink plenty of water); they are of minor value to health (Keep the school room tidy); they are of the negative type (Don't bite your nails); they tend to bring out the reverse of what is desired (Stand straight, Keep your ears clean and free from wax); they are too sweeping and make no allowance for individual differences (Play hard and fair). Statements which are scientifically unsound likewise abound. Some of these are merely mild inaccuracies which state dogmatically as a fact points which have never been scientifically proved and on which there is a difference of opinion (A mid-morning lunch is very beneficial to children; Coarse foods are necessary for health); others are exaggerations (Cooked cereals make children strong and healthy); and still others are definitely inaccurate, (An apple a day keeps the doctor away. Protein causes an expenditure of more energy than it supplies). Attention is likewise called to the omissions in the texts of important types of material, and to the frequent faulty organization.

Having pointed out the shortcomings of the outlines and texts reviewed, the author very properly presents constructive suggestions gained from this material and from her own experience for the improvement of practices in the schoolroom. She outlines a method of organizing the subject matter of health education around health situations as they actually occur in the schoolroom, on the street, in the home. In conclusion the author includes sample pages of the Gates Strang Health Knowledge test which was one of the outgrowths of this investigation.

As a whole the book will be of interest

to directors of health education and others concerned in outlining courses of study, while the practical suggestions in the latter half will also be useful to the individual teacher. The study reveals a need for better courses of study outlined by specialists who can assure the accuracy of the material; outline it clearly, and logically; decide wisely on the grade placement of the various topics; and present the essential subject matter in sufficient detail to make it usable by the average teacher. LYDIA J. ROBERTS

**The Normal Diet, A Simple Statement of the Fundamental Principles of Diet for the Mutual Use of Physicians and Patients—By W. D. San-
sum, M.S., M.D. (2nd ed.) St. Louis:
Mosby, 1927. 136 pp. Price, \$1.50.**

The author has produced a book of much value, which can be read with advantage by the average person. Like the first edition, it contains some statements which are contrary to those made by standard physiological authorities, but these for the most part, concern minor matters.

A number of excellent menus are given, and we find in an appendix a number of weight and height tables taken from various sources. These are useful, if we remember the various criticisms which have been made of such tables, and do not depend too entirely upon them.

The printing and make-up of the book are excellent. M. P. RAVENEL

**Practical Pedodontia Or Juvenile Operative Dentistry and Public Health Dentistry—By Floyd Eddy
Hogeboom, D.D.S., (2nd ed.) St. Louis:
Mosby. 1927. 108 pp. Price, \$3.50.**

This attractively and fully illustrated book gives to the dental practitioner a clear statement of the objectives and methods in the practice of children's dentistry. The chapters present: the embryological development of the head

of the child, cavity preparation for deciduous teeth, filling material used in deciduous teeth, the treatment of the first permanent molar, the treatment of pulps in deciduous teeth, the problem of nutrition related to the teeth, prosthetic appliances, dental prophylaxis, and public health dentistry. All of these phases of the subject carry full illustrations. It is a book for the dental practitioner not for the sanitarian or layman. In his chapter on Public Health and Dentistry the author presents a discussion of the dental phase of the school health program using the work in Pasadena and Los Angeles as illustrations.

C. E. TURNER

**Secrets of Good Health—By Sir W.
Arbuthnot Lane, Bart., C. B. New York:
Doubleday, Page, 1927. 152 pp. Price,
\$2.00.**

This book is hard to evaluate. Much of it is written by the surgeon whose name appears as the author. Three themes predominate. The first boosts the New Health Society, of which Hippocrates is spoken of as the "greatest pioneer," and which is described as the "greatest movement of the age." The second idea concerns constipation, and the third dwells on the baneful effects of white bread, to the eating of which the author ascribes pretty nearly every trouble to which man is heir, up to and including cancer. This part of the book is written in superlatives. We are advised "On no account eat any white bread. . . . the curse of our age is that we are provided with white bread." We are told "that a perfect dietary renders disease impossible," and are warned of the "terrible influence of diet and habit in the production of cancer." We are even told that in schools, time which should be spent in the toilet is "sacrificed to being present at Divine service." There is some very queer bacteriology and even more queer physiology. Some of the chapters written by others are

more conservative, but practically all show the influence of the "New Health Society" which is to bring about such a change in the world if only it can have its way.

The book is made up largely of articles contributed to the *Daily Mail* by the author, and others at his invitation. According to his own estimate "millions of people" have learned good habits and "thousands of letters" have been received showing the "incalculable value" of the teaching which has been given to them.

The book contains a considerable amount of good advice, but on the whole, is the expression of a fad in which there is some substance covered by a large amount of froth. M. P. RAVENEL

Hygiene and Sanitation for Nurses
—By George M. Price, M.D., (5th ed.)
Philadelphia: Lea & Febiger, 1927. 286 pp. Price \$2.25.

This book is divided into 7 chapters, which deal in turn with discussions of mortality problems and the rôle of the nurse; the hygiene of habitations, of foods, of childhood, of occupations; with infectious diseases and their prevention, and with constitutional diseases and personal hygiene. As a practical guide for nurses to modern hygiene and sanitation methods, this book has both good and weak features. It is unfortunate that a 1927 edition should devote a section to chemical means of water purification without mention of chlorination; or should give as an "official" definition of pasteurization "the heating of milk to a degree of heat sufficient to kill all most active germs," without an adequate presentation of modern knowledge regarding the value and increasing use of this method of safeguarding milk supplies. Four pages are devoted to gaseous disinfectants and to methods of disinfection of rooms, a practice discontinued by most modern health departments (except for destruction of insects), as contrasted

with only brief references to methods of immunization of children against diphtheria. The statement that "the Schick test in children has been used successfully by the New York Health Department in other diseases such as poliomyelitis, scarlet fever, measles, etc.," may be somewhat misleading.

The chapters dealing with the hygiene of habitations, and of occupations, are perhaps the most valuable portion of the book for nurses. With the exception of the discussion of milk, the chapter on foods and food supply may also be helpful.

IRA V. HISCOCK

Common Sense Health—By Arthur Geiringer, M.D. New York: F. S. Crofts & Co., 1927. 208 pp. Price, \$2.00.

This book comes to us with the approval of the Life Underwriters Association of Canada. It is very well written in popular language, and for the most part contains good advice which the average reader can follow with advantage. A number of statements arranged somewhat in tabular form give useful summaries of what has been discussed, and serve as concise reminders to the reader of what he should bear in mind. One of these is a series of questions which people should ask themselves in order to determine the general condition of their health.

Special prominence is given to oral hygiene, which the writer considers one of the greatest contributions made to preventive medicine during the last ten years.

Unfortunately there are some evidences of carelessness. The writer seems to regard vaccines and serums as identical, and his statistics concerning the Spanish-American and the World Wars are woefully inaccurate. During the latter, he says that there were only 297 cases of typhoid fever in the entire American Army of over a million men. The fact is that there were 1,897 cases, with 287 deaths, and the number of men

concerned was 4,128,478. We must also disagree with the advice to spray the nose with albolene containing camphor twice a day, especially during the winter months. Specialists say this is injurious, and one very prominent man in this line of work makes the distinct statement that the constant use of oils causes dryness of the mucous membrane of the nose and throat.

With these exceptions the book can be recommended. It is well printed on light paper with a mat surface.

M. P. RAVENEL

A Handbook of Summer Camps—
(4th ed.) Boston: Porter Sargent, 1927.
872 pp.

This is the fourth edition of an annual survey of summer camps for boys and girls from coast to coast. Coeducational camps, camps conducted by religious denominations, and national organizations, camps with school connections and those emphasizing arts and crafts, dramatics, dancing, nature study, foreign language study, and physical educational courses are included in the list. The camps are also listed geographically and the names of directors and endorsing groups are given. The introduction carries a history of summer camps with special contributions by camp directors. The maps and index add to the value of the book, which has been compiled with care and thoroughness.

A. B. T.

Diphtheria Immunization in Schools—Monograph No. 2 published and distributed by the School Health Bureau of the Welfare Division, Metropolitan Life Insurance Co. 22 pp.

This monograph makes suggestions for a workable program, showing how school executives can secure the coöperation of the teachers, parents and children in the diphtheria immunization campaign. It has been prepared by a committee consisting of Prof. C. E. Turner, Massachusetts Institute of Technology, Dr. Peter Sandford, University

of Toronto, and Dr. Florence Brown Sherbon, University of Kansas. The detailed work in the preparation of the study was done by C. Margaret Munson, a special student in the Department of Biology and Public Health, Massachusetts Institute of Technology. A. B. T.

America's Human Wealth—The Money Value of Human Life—
By Edward A. Woods and Clarence B. Metzger. New York: F. S. Crofts & Co., 1927. 193 pp. Price, \$2.00.

Three of the five chapters, about one-half of the book, are devoted to an introduction and to the history of money valuations of human life from the earliest times to the present. In Chapter Three, the title of which is "Modern Estimates of Human Life Values," the authors make no mention of the reviewer, or the most significant modern work in this field, that of Dr. Louis I. Dublin. They do worse than ignore Dr. Dublin's widely known contribution by mentioning an old estimate of his made in connection with a study of the cost of tuberculosis—work long superseded by more recent researches.

In the judgment of the reviewer, a book which makes so serious an omission does not merit the confidence of the reader.

ROBERT E. CHADDOCK

The Oxygen Demand of Polluted Waters, U. S. Public Health Service Bull. No. 173 and Mortality Among Negroes in the United States, U. S. Public Health Service Bull. No. 174. Washington, D. C.: Federal Treasury Department. Free.

Bulletin No. 173 was prepared by Emery J. Theirault, chemist of the U. S. Public Health Service. The bulletin dealing with the Mortality Among Negroes in the United States was written by Mary Gover, Sc.D., assistant statistician of the U. S. Public Health Service with an introduction by Edgar Sydenstricker.

A. B. T.

The Preschool Service in a General Health Program—*Practical Procedures, in the Home, in Medical Conferences, and in Mother and Child Classes*—New York: East Harlem Nursing and Health Demonstration, 354 East 116th Street, New York, N. Y., September, 1927.

This is one of a series of reports on the work of the East Harlem Nursing and Health Demonstration. In a small highly congested area of New York City was organized five years ago an experiment in coöperation by the Henry Street Settlement, the Association for Improving the Condition of the Poor, the Maternity Center Association and the American Red Cross. This booklet covers in outline form with some discussion the procedures used in the home, in medical conferences and in mother and child classes.

The preschool service was so organized that all procedures may be generally classified under one of the three headings of home visits, physician conferences in the center with both nurse and nutrition workers present, and classes of groups of mothers and children. The education of the mother is no doubt the principle around which the whole scheme is organized.

How to reach the 6,000 preschool age children of this community would seem to be a difficult problem but the introduction states:

The service grew rapidly. At only one time was any "canvassing" done to find children and this was soon discontinued as the problem early became one of selection from the large number of children who needed the service and who were known to the field workers.

The contacts were made:

- A. By transfer from the infant service
- B. Through the acute nursing service in families not previously known
- C. Referred by social agencies
- D. In families carried for other health services
- E. Through application to the clinic
- F. Referred by staff workers

Beyond this statement we are uncer-

tain as to how many of the 6,000 children were reached although the statistical summary gives the children and mothers attending the various forms of activity carried on without a definite statement as to whether the same child may have been counted more than once in the several services rendered.

This report not only tells in outline what kinds of procedures and policies were followed, but presents all the routines and principles followed in home visits, the medical conferences at the health center and the lesson plan of the 14 classes for mothers. The organization of the conferences, arrangement of appointments, the equipment, the duties of the staff, the posture class procedure, record forms, printed and mimeographed material used are all presented for the help and guidance of other workers contemplating a similar service. Illustrations of the health center equipment, the staff at work, and the display of posters and lesson leaflets for the mothers' classes gives added interest to this booklet. Suggested equipment with prices for children's playrooms and sources for obtaining materials for posters and exhibits are additional useful features.

With such a presentation of method interest is aroused at once as to evidence of accomplishment, and it is hoped that future publications from this demonstration may, through critical analysis of the activities, throw additional light upon the successes and possible failure that may be expected from such a program.

H. H. MITCHELL

Introduction of Sex Education Into Public Schools—By Thomas M. Balliet, LL.D. New York: American Social Hygiene Assn. 1927.

The title of this small pamphlet explains the contents which also include the administrative problems that arise in connection with this subject. A list of social hygiene publications is given.

A. B. T.

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Epidemiological Report—League of Nations—The fourth epidemiological report of the Health Section of the League of Nations for the year 1926 occupies 100 pages and contains an immense amount of valuable information to health administrators. In previous reports, statistical tables have been arranged to show the conditions in each country separately, but now all information is grouped according to disease. This enables the reader to obtain a better view of the situation of any particular epidemic disease. A detailed tabular index has been prepared, and this makes unnecessary a large number of tables in the text. Carefully prepared maps and charts add interest to the report. The arrangement of these charts and statistical tables in relation to descriptive text is worthy of study by health workers preparing annual reports.

Information on the prevalence of notifiable diseases is now received by the Health Section from practically all countries in which such information is collected. It is amplified by mortality statistics, by cause, for large towns throughout the world. Plague was on the whole more prevalent in 1926 than in 1925. This increase, apparently temporary, occurred in many countries, but was most marked in northern India. The geographical distribution of cholera was similar to that of the previous year. There was observed comparative quiescence in main centers in India, marked extension in various countries further east, with complete absence of the disease west of India. The reappearance of yellow fever in Senegal in October, after the arrival of a convoy of 200 Syrians, gave rise to a series of cases in widely separated localities which had not been infected for many years.

According to this report, the classical type of smallpox has now become fairly rare in Europe, except in the Union of Soviet Socialist Republics, but mild smallpox continues to be spread in England. It seems from mortality reports that the severe form still predominates on the continent, at least in France, southern and eastern Europe. It is stated that the United States is in much the same position as England, in that the mild form has been spreading for a number of years. "Vaccination laws are insufficient in many states and the proportion of vaccinated children is, over large areas, below the safety limit." The situation of the United States is said to be less favorable than that of England because the disease began to spread earlier and is now of more or less common occurrence in practically the whole of the country, while in England, so far, only a limited area in the north is infected.

Typhus fever has decreased, and is now, so far as Europe is concerned, of practical importance only in eastern Europe, although endemic centers still exist in a few other localities. Undulant fever occurs in most Mediterranean countries, but is nowhere very prevalent except in Malta. Enteric fever is spread over the whole world in contrast with most of the diseases previously mentioned. Interesting data are given for different countries regarding the incidence of this disease. The most severe outbreak of typhoid fever in 1926 was at Hanover, Germany, which began toward the end of August and lasted throughout September. There were in all about 2,500 cases and 260 deaths in a population of approximately 425,000. The case mortality rate was 10.4 per cent. This epidemic was preceded by one

of probably between 20,000 and 30,000 cases of acute gastric and intestinal catarrh, which lasted until the end of August. According to conclusions of the government commission, the epidemic was probably due to water-borne infection.

The year 1926 passed without any influenza epidemics of primary importance. "Together with the two epidemic diseases of the central nervous system—epidemic encephalitis and epidemic poliomyelitis—this disease constitutes undoubtedly the most urgent unsolved epidemiological problem." Statistics regarding the incidence of poliomyelitis are not available for all countries. Acute poliomyelitis is stated to be far more prevalent in Europe, North America, New Zealand and Australia than elsewhere. A decrease was noted during the year in the United States and Canada.

The incidence of diphtheria in most countries has in recent years been running its normal course with small temporary increases and decreases. A more permanent improvement seems to have occurred in the death rate from diphtheria, but it has, on the whole, not been so great as in the case of scarlet fever. In the United States where the immunization campaign is more vigorously pursued than elsewhere, there has been a steady decrease of diphtheria since 1921. Measles undoubtedly causes more deaths throughout the world than either scarlet fever or diphtheria, being prevalent in both cold and hot climates and among most races. It probably causes more deaths in Egypt and the adjoining part of Asia than any other epidemic disease. Notification of whooping cough cases is not compulsory in many countries, and is incomplete in most countries. The reports are probably more complete in Denmark than elsewhere; in 1926 there were 890 cases per 100,000 inhabitants. It is an important disease which causes considerable mortality among the very small children

in most countries. In Mexico there were more deaths from whooping cough than from the other three epidemic diseases of childhood combined. It causes a greater mortality than either diphtheria, scarlet fever or measles in the Scandinavian countries, the Netherlands, Germany, Switzerland and Austria.

Hamilton, Ont.—Hamilton's progress in health work is effectively set forth in a report for each of the years ending October 31, 1926 and 1927. The form of the report is of interest. The pages are $8\frac{5}{8}$ inches x $11\frac{3}{8}$ inches. The first two pages give the organization and personnel of the board and the department, the third page carrying a classified financial statement arranged by functions. Photographs of city officials and bureau heads precede an interesting account of the medical officer of health. Effective graphs add to the clarity of the report. An alphabetical index facilitates reference to special topics.

Diphtheria immunization work is carried on in all the clinics, as it was found that a large number of children could be reached through these channels. This city with a population of 123,359 expended through the health department \$87,616 during the current year 1926. A birth rate of 22.5, a death rate of 10.46 and an infant mortality rate of 65 are recorded. It is noteworthy that these statistics with the principal causes of death are briefly mentioned in the early part of the report.

In the 1927 report, interesting charts and tables indicate the trend of diphtheria in this city since 1905. In that year, with a population of 57,561, there were 218 cases with 22 deaths. With considerably over twice that population in 1926 there were 121 cases with 3 deaths, while in 1927 there were only 11 cases with 1 death. "When the department commenced its diphtheria immunization work in 1922 we expected, perhaps, 5 years as the period to elapse

before any appreciable results could be noted. The figures for this year not only show a remarkable diminution in the number of cases and deaths, but far surpass our most sanguine hopes."

New Haven Community Center—How an annual report, with considerable statistical data, may be made interesting and attractive is demonstrated in the 94th report of the Children's Community Center. Effective photographs of children and buildings, with excellent graphs and charts, are distributed throughout. These are carefully arranged in relation to the descriptive text. A study of this report gives one a good picture of the year's work, with its special problems and accomplishments.

In this institution, with its modern buildings and equipment, medical care following a complete physical examination safeguards health; personality trends are studied; psychological examinations are used in educational and vocational guidance; and preparation is given for placement in carefully selected and supervised foster homes. The children are received from other agencies, parents or guardians, without regard to race, creed or color, and no effort is spared to provide them with scientific foster parenthood.

Montreal Anti-Tuberculosis and Health League—The third annual report of this organization contains annual meeting addresses and summaries of a year's work. The address of the chairman of the board of directors is of special interest because of proposals or suggestions made in regard to the work of different official health and school agencies for the improvement or expansion of their programs. The general health situation has been surveyed for this purpose and the recommendations seem in accord with modern tendencies.

From the managing director's report,

it is learned that over 6,000 copies of a booklet *Health in the Home* were distributed in homes under supervision. This manual is also used as a textbook for group instruction. The Royal Edward Institute received 1,300 copies, upon request, for their patients. Through the courtesy of the school commissions, a book-plate of health rules was given to each school child, and under the supervision of their teachers, was pasted in one of their school books. This is an educational device worthy of note. The report contains an excellent analysis of the various types of cases under supervision of the league.

Shreveport, La.—The biennial report of Shreveport for 1925 and 1926 covers the work of the different city departments, including health. Food inspections include all places where food or drink is prepared, served or sold. The U. S. Public Health Service standard milk ordinance has been adopted, and there is an active movement for the pasteurization of milk. All milk and dairy products used in the manufacture of ice cream are either boiled or pasteurized. There were 2,015 samples of ice cream analyzed with 735 plant inspections during the period.

Mosquito control work is said to date from 1923 following a dengue fever epidemic. By a gradual process of education and demonstration, interest has been aroused so that now there are provided systematic control measures practically the year round.

School medical examinations are carried on under the Board of Health. Of 15,591 white children examined, 7,592 were found to have defects, while 6,589 defects were corrected. Of 6,700 colored children examined, 3,109 were found to have defects, while 2,330 defects were corrected. Circulars and booklets on child health have been widely distributed.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Mosquito Larval Food—Mosquito larvae hatched from eggs freed from contaminants were fed upon pure cultures of various unicellular organisms. Yeast, infusoria, algae, and bacteria all proved to be suitable foods, but no considerable larval growth could be obtained on sterile nutrient media or dead organic material.

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was visited upon Santa Ana, Calif. Public health administration would profit if more cities that sowed the wind might reap the whirlwind.

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NEWS FROM THE FIELD

NEW HOSPITAL AT WAUSEON, O.

WAUSEON, O., has been selected as the place for the fifth rural hospital in a series to be built by the Commonwealth Fund of New York in an effort to improve health and medical conditions of rural districts. The hospital will be a 50-bed institution, with a training school and it will be fully accredited. The local medical profession promises its coöperation.

T. B. ERADICATION WORK

THE results of coöperative tuberculosis-eradication work up to January 1, 1928, given in a summary issued by the Bureau of Animal Industry, U. S. Department of Agriculture, show unusual progress in combating this disease. The work of tuberculin testing has been going forward with unusual rapidity in recent months. The number of cattle tested monthly has ranged from about 900,000 to more than a million. The large number of cattle on the waiting list to be tested is regarded as evidence of the desire of livestock owners to avail themselves of the opportunity to free their herds from tuberculosis.

NEW DIVISION OF COMMONWEALTH FUND

THE Commonwealth Fund announces the establishment of a division of publications which will issue reports and studies dealing with the various activities of the fund. As part of its work the new division will continue the series of publications relative to the fund's program in the field of mental hygiene and child guidance, which was begun by the joint committee on methods of preventing delinquency. This committee, created for the demonstration period of the pro-

gram, has now been discontinued, and its staff has become the staff of the new division. The offices are at 578 Madison Avenue, New York, N. Y.



B. S. Pollak, M.D., F. A. C. P., is president of the New Jersey Public Health and Sanitary Association.

PHYSICAL DEFECTS IN SCHOOL BOYS

OF 2,000 boys between the age of 15 and 17 years who attend the East Side Continuation School in New York City, only 225 were found to be without serious defects in an examination sponsored by the New York Tuberculosis and Health Association. About half of the boys had diseased tonsils or decayed teeth, or both; over one-fourth were suffering from defective vision; considerable numbers were suffering from malnutrition, nasal obstructions and infections, and heart defects. Seventy-four boys had lung defects or diseases, including 6 with active tubercu-

losis and 31 tuberculosis suspects. While there were few cases of active tuberculosis, the excessive number of pathological conditions which contribute to lower vitality and resistance was of serious importance in relation to this disease.

HEART DISEASE IN CHILDREN

OF the 120,000 school children in Boston, Mass., 2,311 whose yearly physical examination by school physicians suggested a possibility of heart disease were examined by heart specialists. Of these 625, or one-half of 1 per cent of the total number of school children, were found to have organic disease of the heart; 77 were potential heart disease cases; 265 were classified as doubtful and needing reexamination from time to time. This record is not complete, because the survey only included those children well enough to attend school, and the method of examination may have missed many potential cases.

AMERICAN SOCIETY FOR THE CONTROL OF CANCER

ON March 3, 1928, the American Society for the Control of Cancer will hold its Annual Meeting.

The Executive Committee and the Board of Governors will meet in the morning, at 10:30 o'clock. There will be an interesting exhibit, to which visitors are invited, of a demonstration of modern cancer research at the Crocker Institute of Cancer Research of Columbia University, by its director, Dr. Francis Carter Wood.

DR. KATHERINE B. DAVIS HONORED

A TESTIMONIAL dinner was tendered Dr. Katherine B. Davis on February 2, 1928, at the Hotel Waldorf in New York City, arranged by the National Council of Women.

Dr. Davis was born in Buffalo, N. Y., and graduated from Vassar in 1892. She became a Fellow in Political Economy at

the University of Chicago in 1897. She has received degrees from Vassar College, University of Chicago, Western Reserve University, Yale University and the Universities of Berlin and Vienna.

From 1901 to 1914 she was superintendent of the Bedford Reformatory for Women, and at that time Mayor Mitchell of New York City appointed her Commissioner of Correction. After the World War, Dr. Davis went to Europe for the Y. W. C. A., to do social hygiene work and to study the methods of European physicians in their work.

Dr. Davis recently retired from her position as Secretary of the Bureau of Social Hygiene.

EVERY CHILD'S DIETARY

"EVERY Child's Dietary for Mothers and Children" is a pamphlet recently prepared by Pearl S. Shackelford, nutrition advisor of the New York Tuberculosis and Health Association for the National Federation of Day Nurseries. In a foreword, Mrs. Herman N. Biggs, president of the Federation, states that the dietary was prepared with the mothers particularly in mind. "Our aim has been to present it in simple usable form, with recipes any one can use. It includes the proper proportion of calories, minerals, vitamins, etc." The dietary has received the commendations of Prof. Mary Swartz Rose, Henry H. Shaw, M.D., Charles G. Kerly, M.D., Alfred F. Hess, M.D., Charles Hendee Smith, M.D. and L. C. Schroeder, M.D., prominent nutritionists and pediatricians.

INFANTILE PARALYSIS PREVENTION

THE University of California has received, from an anonymous friend, a gift of \$5,000 a year during his life, and a fund of \$100,000 by his will to be devoted to the prevention and cure of infantile paralysis. The fund may be used, in case of necessity, to combat any serious epidemic which threatens the lives of children in California.

CONTRIBUTION TO DIPHTHERIA
PREVENTION

IN *State Charities Aid Association News* for December, 1927, an announcement was made that the New York State Outdoor Advertising Association will again contribute billboard advertising space for diphtheria prevention posters during 1928. They pledged space valued at \$25,000 for the year. During 1926 the value of the space contributed was \$11,000.

MARYLAND WATER AND SEWERAGE
ASSOCIATION MEETS

THE Maryland Water and Sewerage Association will hold a meeting at the Southern Hotel, Baltimore, Md., April 10 and 11, 1928.

Some of the papers presented will be: "Does the Municipality Know What It Costs?" by Thomas S. Durham; "Fire Insurance Savings and Water Works Design," by F. H. Dryden; "Garbage and Refuse Disposal for Small Communities," by William Raynor Straus; "Treatment of Water for Railroad Purposes," by R. C. Bardwell.

There will be papers on the question of stream pollution prevention and also a discussion of swimming pool sanitation. A field inspection trip is planned to the Towson Sewage Treatment Works and the Baltimore City Refuse Incinerator.

AN AMENDMENT WORTHY OF SUPPORT

AN amendment to the pending revenue reduction bill, which is of interest to members of the A. P. H. A. and members of state and county medical and public health societies has been proposed by Senator Arthur R. Robinson of Indiana. The amendment insures to all members of trades or business organizations the right to deduct from their federal income taxes, traveling expenses incurred in attending meetings of such organizations.

The passing of this amendment would

enable members of the A. P. H. A. and other professional societies to deduct travel expenses incurred by attendance at their meetings from their income tax. Members can urge their respective senators and representatives to endorse the amendment proposed by Senator Robinson.

THE LESLIE DANA MEDAL

THE fourth award of the Leslie Dana Medal, presented annually through the Missouri Association for the Blind to the person selected from the nominations received by the National Society for the Prevention of Blindness, will take place during the 1928 meeting of the American Academy of Ophthalmology and Otolaryngology, in St. Louis, Mo.

Nominations will be received by the National Society for the Prevention of Blindness, 370 Seventh Avenue, New York, N. Y., until May 15, 1928.

Items to be considered in making the nominations are: (1) Long meritorious service for the conservation of vision in the prevention and cure of diseases dangerous to eyesight; (2) Research and instructions in ophthalmology and allied subjects; (3) Social service for the control of eye disease; (4) Special discoveries in the domain of general science or medicine of exceptional importance in conservation of vision.

REORGANIZATION OF NEW YORK CITY
HEALTH DEPARTMENT

IN the reorganization of the New York City Health Department authorization has been given for the creation of a Bureau of Nursing, for the recreation of a Bureau of Public Health Education which has not functioned for several years, and for the consolidation of the Bureau of Child Hygiene, the Bureau of Preventable Diseases and the Division of Adult and Industrial Hygiene.

Louis I. Harris, M.D., health commissioner has announced the appointment

of the following directors of new bureaus and departments: Charles B. Bolduan, director, Bureau of Public Health Education; Amelia H. Grant, R.N., director, Bureau of Nursing; and Herman T. Peck, general medical director.

Speaking of the authorization by Mayor James Walker of this reorganization Dr. Harris explained: "It is a most substantial part of the scheme which was worked out after long study and after receiving the approval of the foremost health experts in the country. This reorganization is by way of housecleaning and to remedy the laxity and demoralization that was found to exist in the department at the beginning of 1926."

Under the direction of the Bureau of Nursing will be placed the 535 nurses employed in visiting homes, schools, and those engaged in clinical services or other field activities of the health department. The consolidation of the medical bureaus will be the first step in bringing about a mobilization of the medical field force of the health department to cooperate with the medical profession at large, in a strictly preventive capacity.

NEW YORK TUBERCULOSIS AND HEALTH ASSOCIATION

LINSLY R. Williams, M.D., has been elected president of the New York Tuberculosis and Health Association to succeed James Alexander Miller, M.D. resigned, who has been president since the organization of the association. Dr. Williams is also managing director of the New York Academy of Medicine.

Walter M. Brunet, M.D., a member of the A. P. H. A., for several years director of the Division of Medical Measures of the American Social Hygiene Association has resigned to become executive secretary to the Committee on Social Hygiene of the New York Tuberculosis and Health Association. Dr. Brunet will serve as a consultant member of the A. S. H. A.



A. H. Flickwyr, M.D., Fellow A. P. H. A., City Health Officer, Houston, Tex., is the representative to the A. P. H. A. from the Texas Association of Sanitarians

DR. MCCARTHY DIRECTOR HEALTH EDUCATION IN NEW YORK SCHOOLS

JOHAN D. McCarthy, Ph.D., M.D., formerly head of the Department of Hygiene, De Witt Clinton High School, has been appointed director of health education of New York City Schools.

Dr. McCarthy is prominent in the health education field. He is an instructor in psychiatry at Columbia University and a member of the staff at Vanderbilt Clinic. For the past 4 years he has been an instructor in health education at New York University and also at Fordham University. Following his graduation from Dartmouth College he received his M.A. at Columbia University, his Ph.D. at New York University. Later he was graduated from Harvard Medical School.

FREE DISTRIBUTION OF PNEUMONIA SERUM

FREE distribution of a limited quantity of the new pneumonia antibody solution for the treatment of lobar pneumonia has been inaugurated by the New York City Health Department. A grant of city funds to defray the expenses for the purchase of the serum has been obtained. Later a charge will be made for the product, but an amount will always be available free for charity cases. It is now available only to physicians who have cases which have been progressing for 3 days or more. The solution will be made in the New York City Health Department Laboratories, but a sufficient amount to supply all needs will not be ready until next fall.

NEW MEXICO

THE State Board of Public Welfare of New Mexico with the approval of Governor Dillon, will borrow \$2,500 with which to inaugurate the anti-malaria campaign in Dona Ana County. It is necessary to commence operations immediately against the malaria bearing mosquitoes which have already appeared and the emergency fund was needed before county money could be made available. Dr. C. W. Gerber, County Health Officer, has worked out the details of the campaign.

STATES COÖPERATE ON STREAM CONSERVATION

MARYLAND, Pennsylvania, Ohio, West Virginia, Kentucky, New York, Indiana, Illinois, and Tennessee have entered into an agreement for interstate stream conservation which provides for joint sanitary control over the waterways in these states. The agreement has been made through the departments of health of the 9 states. The agreement insures the protection and conservation

of adequate and safe water supplies for drinking and commercial use.

An advisory board composed of the chief engineers of the 9 states will advise on the policies and methods of sanitary engineering problems involved.

PENNSYLVANIA PUBLIC HEALTH ASSOCIATION

THE Pennsylvania Public Health Association held its annual meeting at Philadelphia, February 13-14.

The officers elected for 1928, are: President, J. C. Reifsnyder, M.D., Scranton; First Vice-President, J. T. Butz, M.D., Allentown; Second Vice-President, John M. J. Raunick, M.D., Harrisburg; Secretary-Treasurer, Wm. C. Miller, M.D., Harrisburg; Assistant Secretary-Treasurer, Edgar S. Everhart, M.D., Harrisburg.

Those elected to the executive committees are: Theodore B. Appel, M.D., Harrisburg; Thomas W. Henderson, Washington; W. E. Matthews, Johnstown; Thomas Herbert, Altoona; C. B. Auel, Pittsburgh, and H. C. Frontz, M.D., Huntingdon.

TEXAS

THE First Short School for Dairymen and Milk Dealers in San Angelo, Tex., and adjacent territory was held at San Angelo, February 23 and 24. The school was arranged under auspices of the Dairy Division, the Board of City Development, the City Health Department, the Texas Association of Sanitarians, and the State Department of Health. The economy of high grade dairying, dairy barn construction and sanitation, the standard milk ordinance inspection code, demanding health examination certificates from dairymen and food handlers, and milk as a food were among the topics discussed by experts.

PERSONALS

Drs. William F. Passer, Twin Falls, Ida., and George F. Ashley, Montpelier, Ida., have been appointed members of the state medical board, and Drs. Frank W. Almond, Boise, Delos E. Cornwall, St. Maries, and Charles F. Hanmer, Salmon, reappointed members of the board for 1928.

Dr. George H. Lowthian, formerly of Milbank, S. D., has joined the staff of the veterans' hospital at Boise, Ida., succeeding Dr. William S. Titus, who resigned.

Dr. T. Restin Heath, formerly medical superintendent of the Flint-Goodridge Hospital, New Orleans, La., has been appointed superintendent of the Bethany Hospital in Kansas City, Kan.

Dr. James H. Huddleson, Jr., has been appointed consulting neuropsychiatrist at the U. S. Veterans' Hospital 81, New York, N. Y.

Dr. Bruno S. Harwood has resigned as head of the sanitary department of the board of health on Staten Island, effective February 10, and will assume the superintendency of a tuberculosis sanatorium in Sullivan County.

Dr. Andrew J. Crowell, Charlotte, N. C. was elected president of the North Carolina State Board of Health, January 23, to succeed the late Dr. Joseph Howell Way, who held that position for about 15 years.

Dr. Elijah B. Pickel, Medford, Ore., has been elected president of the Oregon State Board of Health to succeed Dr. Willis B. Morse of Salem. Dr. Harold C. Bean was elected vice-president and Dr. Frederick D. Stricker, secretary.

Dr. Philip W. Boyd, Winchester, Va., was elected president of the Virginia State Board of Medical Examiners to succeed the late Dr. Robert Glasgow.

Dr. Arthur H. Cohn has been appointed chief police department surgeon of Milwaukee, Wis.

Dr. Claus T. Droege, New York, Wis., has been appointed prison physician of the state penitentiary at Waupun, succeeding Dr. Wallace P. Smith, who held the position since the recent death of Dr. John F. Brown.

C. G. Crow has been appointed city health officer of Oroville, Calif., to succeed John O. McAtee.

Dr. T. Dwight Sloan of Ohio has been appointed Superintendent of the Post Graduate Hospital, succeeding Col. Louis G. Trimble, who resigned.

Dr. W. M. Taylor, health officer of Mooers, Clinton County, N. Y., for 20 years, died on January 13.

Dr. Frederick A. Hemsath, a former member of the staff of the New York State Laboratory, has been appointed director of the Cattaraugus County Laboratory.

Dr. John H. Korus has been appointed superintendent of Rocky Crest Sanatorium at Olean, Cattaraugus County, N. Y.

Dr. William L. Somerset, chief diagnostician of the New York City Health Department died January 11 from thrombosis while undergoing an operation for appendicitis. Dr. Somerset was associated with the city health department for over thirty-five years and was widely known for his diagnostic ability in communicable diseases, especially smallpox.

Dr. S. H. Bennett of Little Valley, Cattaraugus County, N. Y., died January 1. Dr. Bennett was health officer of the town of Greenwood from 1909 to 1918, of the town of West Union from 1912 to 1918 and of the town and vil-

lage of Little Valley from 1918 to the date of his death.

Dr. Albert Mueller has been appointed city physician of Rock Island, Ill., to succeed the late Dr. Joseph Hollowbush.

Hazel Goff and Mary Elizabeth Tennant have been appointed field directors of the Paris Staff of the Division of Medical Education of the Rockefeller Foundation.

Miss Alma C. Haupt, assistant director of the Commonwealth's Fund Division for Austria, has been transferred to the staff of the New York office and will be in the division of Rural Hospitals.

Dr. J. A. King of Ojai, Calif. has been appointed health officer of Ventura County, to succeed Dr. A. A. Maulhardt.

Dr. I. C. Riggin, former health commissioner of Lorain County, O., general health district, has been appointed associate secretary on the staff of the Cincinnati Public Health Federation. He will direct the programs of the heart council and the cancer council.

The Department of Soldiers' Civil Re-Establishment of Canada has been transferred to the jurisdiction of the Department of Public Health and Dr. J. A. Amyot, C.M.G., Deputy Minister of Health will be Deputy of both branches.

Dr. Charles E. Shultz, health director of Bloomington, Ill., has resigned to become superintendent of Fairview Sanatorium of Illinois.

Dr. Michael A. Cunningham, formerly assistant superintendent of the tuberculosis hospital at Oakdale, Ia., has become medical director of the Holy Cross Sanatorium at Deming, N. M.

Dr. James W. Bazell has been appointed health officer of Winslow, Ariz., to succeed Dr. John R. Walls.

Dr. James R. Dykes, of Marshallville, Ga. has been appointed health officer of

Grady County, Ga. He will succeed Dr. Mannie A. Fort who has had charge of the health work in both Grady and Decatur Counties. The combined county health program could not be continued according to report, since state and federal aid had been exhausted.

W. G. Stronquist has resigned as director of the division of sanitary engineering of the health department, Memphis, Tenn. to accept a similar position in Birmingham, Ala.

Dr. Augustus A. Oliver, Paris, Tenn., has been reelected county health officer. He is also city health officer of Paris and has been in public health work for about 20 years.

Dr. George D. Butter of Pulaski, Tenn. has been elected health officer of Giles County, Tenn.

Olive Chapman, formerly with the New York County Chapter of the Red Cross is now executive secretary of the chapter at Greenville, Miss.

Dr. Nelson A. Bryan, formerly of Atlanta, Ga., sailed on January 17 for the Southern Baptist Mission Hospital at Hwanghsien, China. He will be the only American physician connected with the hospital.

Dr. Ray S. Dixon, director of venereal clinics, department of health, Detroit, Mich. delivered the De Lamar lecture on hygiene at the Johns Hopkins School of Hygiene and Public Health, January 24, on "Factors in the Control of Venereal Disease."

Dr. John Sundwall, professor and director, division of hygiene, public health and physical education, University of Michigan Medical School, Ann Arbor, Mich., was elected president of the Michigan Public Health Association at its 7th Annual Meeting at Lansing, Mich., January 13.

Hibbard R. Norman, Health Officer of New London, Conn., has appointed

American Journal of Public Health

and THE NATION'S HEALTH VOL. X NO. 4

Volume XVIII

April, 1928

Number 4

Experience With the Program of Cancer Control in Massachusetts

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and

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MANY changes have occurred in the Massachusetts death returns in the past twenty-five years. The death rate for all causes has dropped from 1,695 per 100,000 in 1901 to 1,256 in 1926. The median age at time of death for all causes has increased from 38.8 to 57.8 years.

The rates for many of the individual diseases have shown material changes. Among these are typhoid fever, which has decreased from 19.7 to 1.4; scarlet fever which has dropped from 13.5 to 2.78; diphtheria which has declined from 34.3 to 5.9; and tuberculosis which fell from 235.0 to 83.4. During this same period, however, the circulatory diseases have increased from 163 to 309, diabetes from 11 to 19.8, and cancer from 73 to 127. Fifty years ago the chronic degenerative diseases comprised one-eighth of all deaths. Today they comprise over one-half.

While other factors than public health accomplishments have been instrumental in lowering the rate of some of the diseases, there can be no doubt that part of the decreases have been the direct result of this work. Better diagnosis will account for an additional part of the seeming increases. Regardless of the reasons for the increase in the degenerative diseases, it is apparent that these diseases are fast replacing others as causes of death, and public health measures should be instituted toward their control.

The Massachusetts Department of Public Health has started a campaign against the degenerative diseases by inaugurating a cancer program, as the cancer situation seemed more urgent than that of any of the other diseases in Massachusetts. A comprehensive study of cancer with the facilities for its control was first made. This included a review of the cancer literature, surveys in selected towns and cities, questionnaires to doctors, hospitals, and overseers of the poor, a statistical study of the cancer death records, and numerous interviews with recognized authorities on the disease.

In 1842 the cancer death rate was 13 per 100,000; in 1860 the rate was 26; in 1900 it was 71; while in 1926 it was 126.8. That this increase is not all real is obvious. In the early years many deaths which were undoubtedly due to cancer were certified as senility, stomach trouble, or unknown cause. Even at the present day, there is still confusion in diagnosis, and the rate of 126.8 is probably too low, but when allowance has been made for improvements in diagnosis and better certification, there still remains a definite increase in the cancer death rate. This increase in rate present in both sexes, is greater among males than females. In the female group there has been a tendency for the curve of cancer death rate to flatten. This was so marked in 1926 that there were 300 less deaths than might have been expected from the study of the long-time trend.

In the years 1920 to 1925, Massachusetts had the highest cancer death rate of any state in the Union, when adjustments had been made for age and sex distributions. In this same period, New York was second, Rhode Island third, and Connecticut fourth, while many of the southern states had very low rates.

The average person waits about 8 months between the first symptoms noted and the first consultation with a physician. Boston citizens wait one-half a month longer before submitting to an operation than do the residents of the state outside Boston. When we know that the chance of cure decreases as much as 16 per cent per month in one type of cancer, it is apparent that the long delay is the cause of many needless deaths. At the present time, in Massachusetts there are a sufficient number of hospital beds to care for all operative cases, but there is a need for more beds for terminal cases. With the present delay in seeking medical advice, the number of terminal beds needed in Massachusetts is about 10 per cent of the number of yearly cancer deaths. If the 8 months' delay can be appreciably reduced, the number of terminal cancer beds needed will likewise be reduced. Facilities for x-ray and radium treatment are not uniformly available throughout the Commonwealth.

Our cancer control program is divided into four parts: hospitalization, clinic, education and investigation.

The hospitalization program has two aspects: one dealing with immediate care for the patient, the other with the determination of a long-time policy for such cases. The Pondville Hospital, renovated and opened in 1927 to receive cancer cases, is meeting in part the first of these needs. Here, 90 cases can be cared for, two-thirds of them bed patients and the remainder ambulatory. The hospital is being conducted in the most approved manner. The service given is adequate and equals or excels that obtained elsewhere. A visiting committee supplemented by a special worker is endeavoring to furnish a home-like atmosphere in the institution.

Perhaps the most important part of the project, as far as quality of service is concerned, is the consultative staff from Boston. Every effort is being made to admit as many early stage cases as possible for diagnosis and treatment in order to keep down the death rate and minimize the stigma likely to become fastened to an institution largely serving incurable cases. Early stage cases can be sent from nearby clinics as they develop. Only patients not otherwise able to obtain institutional services are accepted. Should institutions already handling incurable cancer begin transferring their patients, the 90 available beds at Pondville would soon be filled without in any way meeting the need for which it was meant.

The number of cancer patients applying furnishes facts for any program of expansion as well as suggestions for a policy for other chronic diseases. The question of centralization against decentralization as applied to hospitalization can be fairly answered after a few years' experience at Pondville. Will the patient come to a central institution to die, or will he prefer to remain near home? In tuberculosis it has frequently happened that the dying patient insists on returning home. Before embarking upon a large program of central hospitalization for cancer we must know whether our experience with this disease will be the same.

How much can be done for the cases in their homes? Hospitalization for chronic cases is the most expensive form of care. It is estimated that adequate hospitalization for a cancer patient will cost at least \$35 a week. In the 6 months that the Pondville Hospital has been in operation there have been 168 admissions. This number is too small to draw conclusions of any character.

With over 5,000 deaths annually from cancer in Massachusetts, and with the cancer death rate steadily on the increase, it seems absurd to await complacently the discovery of some medical cure for cancer

before undertaking measures for the control of the disease. Such an interval of waiting in tuberculosis would have been inexcusable. For the state merely to furnish a hospital or home for the individual with cancer to pass his last days in some degree of comfort is equally shortsighted. A state cancer program must be broader and include measures which attempt to reduce the number of hopeless cancer cases.

With our present knowledge, the cure of cancer is only possible when diagnosis is made at an early stage of the disease, and prompt treatment instituted. In our study of clinic cases we have found that the average cancer case comes to the doctor 7.4 months after the first symptoms, but even then, many of them delay longer before having adequate treatment.

Any program which will successfully lower the cancer death rate must attack the delay on the part of the practicing physician as well as on the part of the patient. The most rational method of attacking these obstacles is by means of the cancer clinic.

The clinic will first give an opportunity for individuals to receive diagnostic service. It will be composed of a group of physicians recognized in their community, who are all thinking in terms of cancer. Any individual regardless of his financial standing may receive an opinion from this group. Those able to pay will be referred from the clinic to private physicians, while those unable to pay will be referred elsewhere and followed up for care and treatment.

That expert advice on cancer is needed for early diagnosis can be readily appreciated when it is realized that the average physician in Massachusetts sees between 4 and 5 cases per year, and these of different types. As each type demands a different kind of skill in its diagnosis, a physician seeing fewer than 1 case a year of a given type cannot be expert. The staff of the clinic will be composed of a group, each seeing many cases of the type of cancer peculiar to his own specialty. The interest in cancer among the profession will be further increased by consultation visits supplemented by forum discussions by experts from the larger centers. Such group specialization in fractures, goiter therapy, etc., has accomplished much in improved quality of service.

The surgeon will find patients more readily accepting his advice when it is supplemented by that of the clinic group. Where clinics have been functioning it has been found that many persons who refused to take the surgeon's advice regarding early operation, after attending clinics and having the same advice given them, returned to their surgeon for treatment. The community spirit aroused by the clinics will have a tendency to keep the subject of cancer before the lay public, and

can react only favorably in getting patients under treatment at a much earlier stage than is the case at present.

The department is endeavoring to establish clinics in a number of strategic centers. Since a cancer clinic demands not a single physician, but a group of specialists including the surgeon, the general medical man, the pathologist, roentgenologist, rhinologist, urologist, gynecologist, etc., and since its needs are not limited to the four walls of the clinic room, but demand the full resources of a modern hospital, the department has decided to stimulate clinics first in those communities that have the most to offer in professional coöperation and hospital resources.

An opportunity is asked to present the program to the organized medical profession of a given city. If it seems suitable, the local medical profession passes a vote of support to the program and authorizes the appointment of a local medical cancer committee. This committee is responsible for determining where the clinic or clinics shall be held, for outlining the policies, organizing the staff, supervising the quality of service, and directing the growth. The department meets with this committee to determine how it can best assist with its resources in personnel, supplies and funds.

The medical committee also appoints a local lay cancer committee. This latter must determine such matters as education of the local public in regard to available resources and their proper utilization, and must face the unutterable, tragic, social and economic problems which will be uncovered, as well as decide the best solution of home or hospital care for the incurable, since many will not want to die in a remote institution. The department has personnel and other resources for these lay committees, but each community must be sufficiently stirred to the need of largely meeting its own problems. Too many sound programs have failed because of local indifference or antagonism.

Each clinic is required to furnish a social worker. She will be appointed by and under the direction of the local committee. She will attend all clinics; be responsible for all special records and reports; will do the follow-up work and visit patients in their homes to see that they are receiving proper treatment and care. She will coördinate the clinic with other community social and welfare agencies, both local and state. In many cases, she will diagnose the social and financial status of the patients and plan for their further treatment or hospital care.

The minimum standard training for such a worker is graduation from a recognized school of social work, including a course in medical social service, or graduation from a recognized training school for nurses plus a course in public health nursing, or two years of general

case work with a recognized social agency and a year's experience in medical social work.

The department has a medical social worker whose duty will be to coördinate the social work in the various clinics and to find means by which follow-up work may be carried on in the non-clinic communities. The policies of social service as it relates to cancer control will be further worked out by the department with the aid of our advisory committee composed of leaders in the social and nursing field. Publicity will also be needed to disseminate facts regarding the possibilities of prevention and cure of cancer in its early stages.

In some localities the clinic is a single hospital, while in others the clinic has branches in several hospitals, and meets at different times in each of them. While the staffs of the different branches vary, there is but one management and one social worker.

Cancer clinics have already been developed in 6 communities, and within a few months this number will be increased to 12 or 13. The first clinic was organized on December 17, 1926, and the sixth on June 30, 1927. Up to January 1, 1928, 1,360 individuals have attended the clinics.

In the records are many facts which may be instrumental in determining our future policies. Thirty-one per cent of the clinic attendance has been men and 69 per cent women, and 23.1 per cent were found to have cancer. Of the group having cancer 68.8 per cent were reported to be in the operable stage. The median age of the non-cancerous individuals who attended the clinics was 46 years, while that of the cancer patient was 60 years. Of those coming to the clinics 61.6 per cent came because of newspaper publicity, 20.1 per cent at the advice of a physician, and 18.3 per cent for other reasons.

The symptoms which the cancer patients presented are classified as follows:*

Swelling	36.8	Ulceration	9.0
Pain	44.8	Deformity	2.8
Loss of Weight	8.2	Malaise	4.1
Discharge	13.9	Scaly skin	1.7
Itchings	0.7	Bleeding	0.7
		Unknown and Others	7.1

* As many patients had more than one symptom, the total is more than 100 per cent.

The location of the disease was as follows:

	Per Cent		Per Cent
Buccal cavity	22.6	Male genitals	1.6
Stomach, liver group	2.5	Breast	19.1
Peritoneum, intestine, rectum group	4.8	Other organs	1.6
Skin	30.2	Unspecified	3.8
Female genitals	13.4	Not stated	0.3

Of the individuals with cancer 14 per cent had never consulted a physician; 43.3 per cent had consulted one physician before coming to the clinic; while 33.1 per cent had consulted more than one physician, and the remainder gave no information.

The department has appointed an advisory committee to determine the best methods of publicity. One member of this committee is the state chairman for Massachusetts of the American Society for the Control of Cancer. This organization is a great aid in the state's program. At present the state is distributing literature, furnishing newspapers with material, as well as maintaining a speaker's bureau. Efforts are being made to get into closer touch with the local organizations and to interest them both in the state's program and the disease itself.

In the clinic centers the local lay committees will have charge of all publicity. Many cases will be brought to the attention of the committee. It will make arrangements for individuals who either cannot or will not avail themselves of the facilities at Pondville or elsewhere. One of its functions will be to study community resources and see in what way such problems can be solved. With sufficient interest aroused, money may become available for beds and wards to be added to existing institutions, in some instances, and for special hospitals in others.

The educational campaign should stress the following facts:

1. At first in all cancerous processes, cells in some part of the body begin to multiply. At this stage, the process is purely local and if the cells are completely removed, there will be no further recurrence of the cancer; if not removed, cells may wander to other parts of the body, and by increasing in number, may form new growths there.
2. Cancer cells in various localities act differently: cancer of the skin is a slow growing cancer and not particularly malignant; cancer of the breast is a more rapidly growing cancer and more malignant; while cancer of the mouth grows very rapidly and is extremely malignant.
3. Cancer is a disease largely confined to late adult life.
4. Cancer is often preceded by long continued irritation. Measures used to prevent such irritation should be adopted. Among these may be mentioned: improved dentistry, abstinence or limited use of tobacco and alcohol, treatment of chronic mastitis, repair of lacerated cervix, more exercise and less food.
5. Any continued irritation, any lump, any abnormal discharge, any sore that does not readily heal, any wart or mole that changes in size and appearance should arouse suspicion and send the individual to his physician.
6. Pain may not be a symptom of early cancer, and people should not wait for its appearance before consulting a physician.

Hospitalization will care for the terminal cases; clinics will aid in reducing the volume of hopeless cancer; but these will not lower the incidence of the disease.

Although mortality figures and hospital records for this disease are available and have been freely studied, little is known regarding cancer

morbidity in the community at large. The physicians of Newton, Mass., are, therefore, conducting a morbidity study. The number of those who die of cancer can be ascertained, but as the individuals who had cancer and have been cured are usually reticent regarding their condition, the exact number of cures is unknown.

The visiting nurses throughout Massachusetts are completing questionnaires which give in detail information regarding the habits of the cancer patient. Similar information is obtained from a non-cancerous patient as a control. When a sufficient number of questionnaires are available, any difference which may exist between the habits of the cancer patient and the non-cancerous individual can be noted, and studies can be made to determine whether these differences are significant.

Two morbidity surveys have been made in which all householders in 2 towns were interviewed. When these figures have been completed and tabulated, information regarding other degenerative diseases beside cancer will be available.

The death records of all cancer patients are being tabulated. From them we have already learned facts concerning the prevalence of cancer, the ages at which it is most common, the life duration of those with or without treatment, the geographical distribution, the relation between cancer and population density, and the relation to nationality.

When a patient presents himself to one of the state-aided cancer clinics, a few questions are asked regarding the symptoms and what induced him to come to the clinic. It is felt that the average patient presenting himself should be questioned as little as possible owing to his emotional strain; and extensive questioning of patients might tend to decrease the attendance. The few facts obtained, however, will furnish valuable data on the social aspects of the disease and the value of the various forms of educational publicity.

To determine the effectiveness of the Massachusetts state cancer program will be a problem for the future. But because of widespread interest in the disease, community interest is relatively easy to obtain, and in any preventive program community interest is the head-stone of the corner.

Free Dental Treatment for Cuban Children

FREE dental treatment has recently been established by the Cuban Department of Public Health for public-school pupils of Habana and nearby towns, when their parents cannot afford to pay for such service. To facilitate the service for suburban children conveyances have been provided to take them to the dental offices.

The Prevalence of Rabies in the United States and the World*

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and

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RABIES deserves to be considered one of the most important of health problems. The number of deaths is not appalling but the suffering and fear caused by it are so great that they make this the most dreaded of all diseases. The co-authors of this paper, having both served at different times as director of the Indiana Pasteur Institute and, having seen the great increase in the disease in that state, determined to find to what extent this condition prevailed in other states and in other parts of the world. Data on the subject are fragmentary, hard to get, and not at all reliable.

Questionnaires were sent to the health officer of every state in the Union, to all the provinces of Canada, and to practically all foreign countries, asking for data on rabies in man and in animals. By this and other means information was received from every state though not always was the information complete. Medical literature was exhaustively searched for references to geographical distribution of the disease and for evidences of its increase or decrease. About thirty foreign countries answered our letter—a most interesting correspondence. A voluminous letter from Japan is still untranslated.

From this large mass of evidence we have endeavored to sort out the salient facts, though we are keenly aware of the fact that much of the data is conflicting, as for example the total number of human deaths as reported to us by states, and as reported by the Bureau of the Census for the U. S. Registration Area.

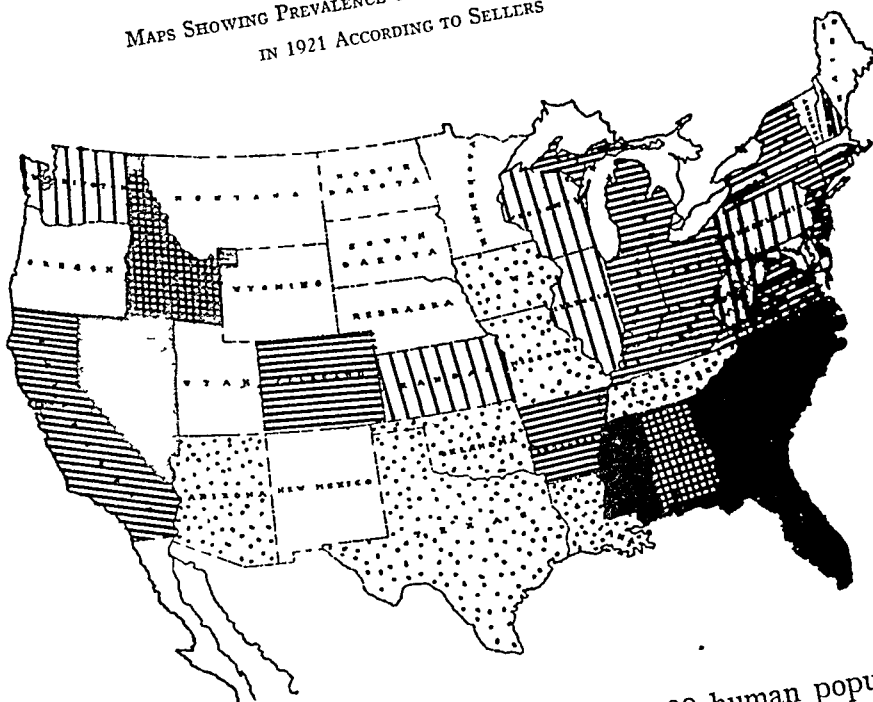
In order to show present conditions in as graphic a manner as possible we have attempted to shade a map of the United States to represent the prevalence of rabies. This map was made as nearly as possible on the same scale as another published by Sellers¹ representing conditions in 1921, also presented here. Sellers's shading is made on basis

* Read before the Laboratory Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 19, 1927.

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FIGURE 1

MAPS SHOWING PREVALENCE OF RABIES IN UNITED STATES IN 1921 ACCORDING TO SELLERS

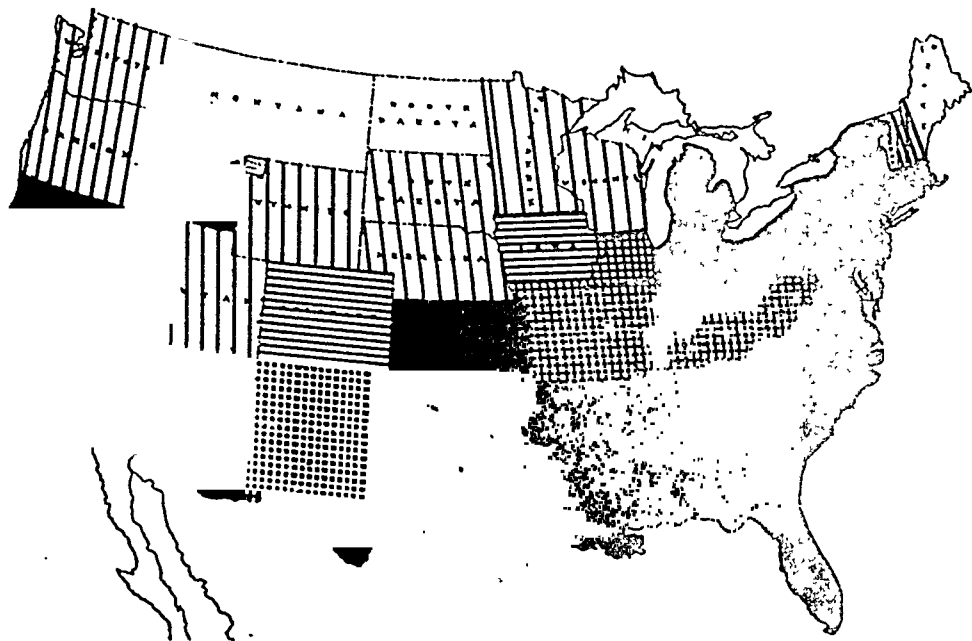


of the number of cases in animals per 100,000 human population—not a very satisfactory basis but the best that could be devised under the circumstances. Frequently in the case of our investigation such a source of information was evidently unreliable, and in such event any other available source of information was used. If, for example, the number of human deaths for a given state was high that state was made black even though the number of cases in animals reported was low (incomplete returns). The state of New York was made black on basis of various references to the condition in medical literature. Texas was made black on the strength of newspaper reports and records of companies selling rabies vaccine. Such sources are not highly satisfactory, but we believe that with this explanation their use is justifiable.

It is interesting to note that Kerr and Stimson¹ found little of this disease in the western states in 1908. They report that California, Idaho, Nevada, and New Mexico were free of the disease, while in 1926 these states were heavily infected. Indeed, California has had more deaths (human) in recent years than any other state of which we have record (68 deaths since 1909). California shows two peaks in her epidemic, 1912-13 with 9 and 8 human deaths respectively, and 1923 with 11.

FIGURE II

RABIES IN THE UNITED STATES IN 1926
 MAP MADE ON THE SAME BASIS AS THAT OF SELLERS
 AS FAR AS WAS POSSIBLE



KEY

Dotted	.....	no data							
White	.....	no rabies							
Vertical lines	.....	less than one	positive head per	100,000 human population					
Horizontal lines	.....	one to five	"	"	"	"	"	"	"
Crossed lines	.....	five to ten	"	"	"	"	"	"	"
Solid Black	.....	ten or more	"	"	"	"	"	"	"

The following states reported that the disease is now increasing or has done so in very recent years: Arkansas, California, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Massachusetts, Michigan, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, Tennessee, Virginia, West Virginia, and the District of Columbia.

If we pin our reliance upon figures it would seem that there has been a very great increase in certain states (See 4 charts).

Considering the seriousness of this disease both in man and animals it is quite surprising that there are so few reliable records. The loss of stock and the expense of giving treatment to man and beast must cause the expense of this strictly preventable disease to mount well into the millions of dollars each year. The loss of human life is by no means inconsiderable. Apparently the most reliable records are those of human deaths reported to the Bureau of the Census.

Rabies in other countries than our own may be of some interest. The data presented is from questionnaires and from the literature.

Canada—Since the map of the United States shows very little rabies in the northern states we might expect still less in Canada. Our data bear out this expectation, though we know there is some of it in the Arctic regions.

Alberta—No record of any case in ten years.

British Columbia—Only one case in any animal known, and this was in a dog brought in by a tourist. No human deaths.

Manitoba—Some rabies in animals. No human deaths.

New Brunswick—None since 1918. No records previous to that date.

Nova Scotia—None in animals or man.

Ontario—After several years' freedom from the disease it was introduced from Quebec and quickly spread. Forty-one positive brains were examined in 1926. No human deaths.

Prince Edward Island—Questionnaire not answered.

Quebec—Rabies spreading rapidly from two foci. No human deaths.

Saskatchewan—No rabies 1926.

Alaska—Not common but has been observed particularly in wolves and foxes.

Arctic Regions—Nansen mentions the occurrence of rabies in "Farthest North," and it has been reported from Greenland.

Mexico—Rabies is very common. There are many Pasteur Institutes and thousands of treatments are given annually. The number of human deaths is rather large but exact information is not available.

Cuba—Has been epidemic to a serious degree in recent years.

South America

Ecuador—Not common.

Venezuela—Rare in animals and extremely so in human beings.

Argentina—Fairly prevalent.

Brazil—It has been epidemic at different times especially in the north.

El Salvadore—Present.

From incomplete returns we may reasonably conclude that the disease is present in moderate amount in the greater portion of the continent.

Europe

Belgium—There has been very little rabies except during the Great War when antirabic precautions were relaxed. During times of peace elaborate precautions are taken to prevent its introduction. These methods have been highly effective.

England—By strict muzzling ordinances, England was able entirely to rid the country of the disease in 1902. After that time there was none until 1918 when the disease was re-introduced. It spread rapidly but has again come under control and there has been none since 1922.

France—The home land of Pasteur has long been seriously plagued with rabies. In 1913 it was almost eradicated but flared up again during and after the Great War to alarming proportions. It is at present declining.

Germany—The rabies situation was well in hand before the war, there being on the average 300 to 400 cases in animals annually. In 1915, it rose to 1018, after which there was an irregular increase to 2699 in 1924. Since that date the condition has improved and is greatly reduced in 1927. Human deaths were as

follows: 1924, 48; 1925, 20; 1926, 22. Persons bitten by rabid dogs for the same years were 2417, 1159, and 579 respectively.

Holland—Because of very rigid control measures there were no cases of rabies in Holland previous to the Great War. During that crisis there was some in the borders of the country but again none since.

Ireland—There has been no rabies for twenty years. All immigrant dogs are quarantined for six months.

Russia—No communication was received from this country, but it is well known that the rabies situation there is very serious, perhaps the worst of any country in the world. The disorganized state of the government, the prevailing ignorance, and the vast territory involved makes the situation well nigh hopeless.

Sweden—There has been no rabies since 1886 when there was one case in an imported animal. Strict regulations govern the importation of all members of the dog family.

Switzerland—Rabies is rare. Three hundred and twenty-nine Pasteur treatments were given in the quarter of a century just closed, and there was one human death.

Austria—Has been epidemic in recent years.

Italy—No very recent data, but has been quite common for a long time.

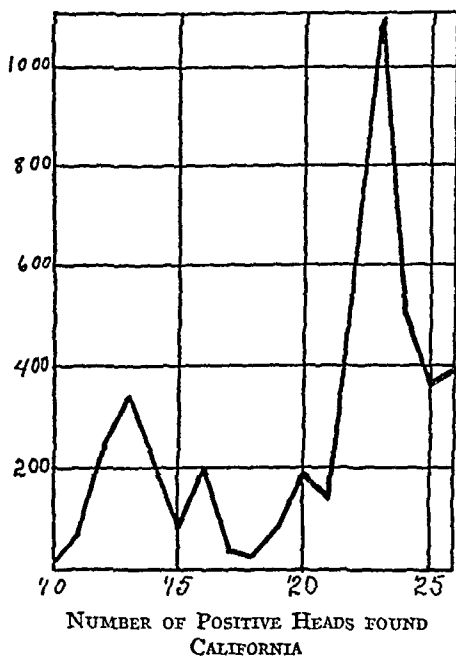
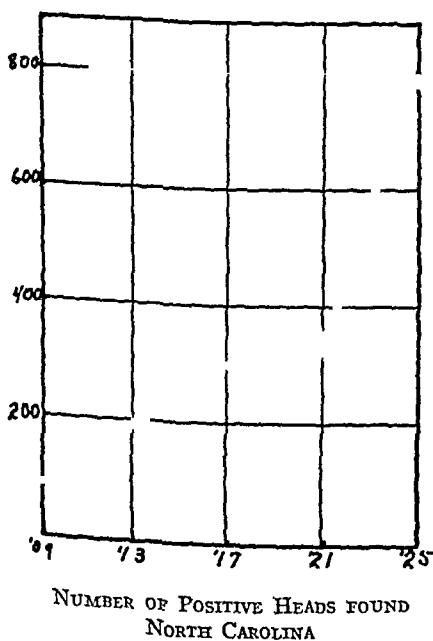
Balkan States—It has been an important problem here since the Great War and the years immediately preceding.

Spain and Portugal—Rabies very important public health problem.

Africa

Egypt—Rabies is very common among the countless homeless dogs. There is little effective control of the situation. The number of cases treated trebled from 1914 to 1924, but has decreased since. One thousand two hundred and fifty-one treatments were given in 1926 at Cairo alone.

Union of South Africa—fairly common in animals, and occasional cases in human beings.



Occidental French Africa—Rabies present but not prevalent.

Western Africa—Rabies is common.

Asia

Palestine—Rabies is very common.

Arabia—Common in the settled portions.

India—Data from the Pasteur Institute at Calcutta for the province of Bengal (population, 40,000,000): 1924 (7 months) 1995 patients treated, of whom 17 died; 1925, 5585 cases treated of whom 33 died. Total deaths for Bengal (human) 304 in 1925.

Japan—A very serious public health problem.

China—Rabies was known in the time of Confucius and has been a serious problem continuously to this day.

Siam—Very common.

Siberia—Very prevalent.

Tibet—Prevalent.

Oceanic Islands

Australia—Free of rabies and has always been so.

Hawaii—Free of rabies. All animals from foreign ports are quarantined for 128 days.

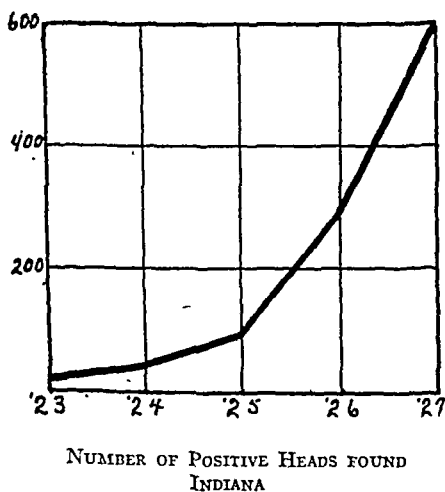
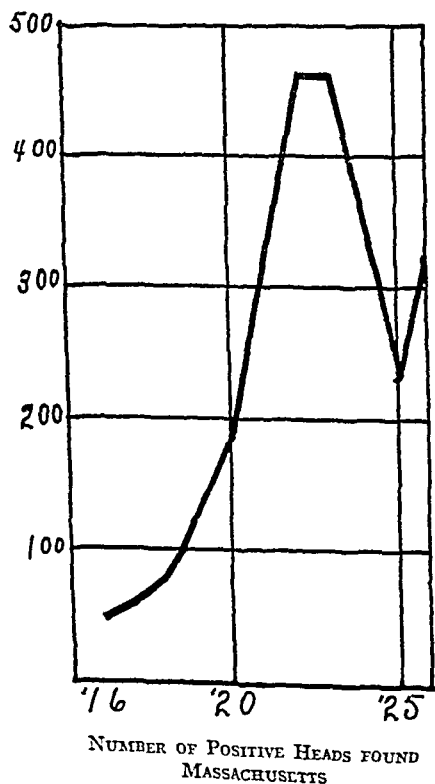
Philippines—Rabies is very common among the many dogs. Human deaths were 103 in 1925; 93 in 1926.

Dutch East Indies—Fairly common.

SUMMARY

1. Rabies is on the increase in the United States, or at least was so two years ago.

2. It increased in Europe during the Great War but has declined somewhat during the last three to five years there.



3. It has been completely eradicated from certain countries, while in others it has apparently never existed.

4. In the main, rabies is more prevalent in those parts of the world where civilization is retarded, and poverty prevails.

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DISCUSSION

Dr. Strauss, Virginia—I can only second what Dr. Rice has said as to the extreme difficulty in getting reliable figures on the subject. A few years ago we checked up on the human deaths, and found that the only figures upon which we could place any dependence were numbers of positive dogs heads reported. We get that information not only from our own laboratories, but from the Washington laboratories who report all positive heads that they get from the northern part of Virginia. In that way, we are able to follow fairly well the progress of the disease through the state.

A few years ago, there was a very obvious increase along the entire southern border, which increase appeared to move gradually up through the state. By the time it reached the central section, it began to drop off, and this year we have a very decided decrease in the amount of rabies. Concerning our positive heads, for a fixed 8 months for 1925, 1926 and 1927, we find that in 1926 we had an increase of 57 per cent over 1925, while in 1927 we have a 30 per cent decrease under 1926. I believe the disease is really decreasing, temporarily at least, with us in Virginia.

I had the opportunity to watch a very definite epidemic in Richmond a year ago last spring. We had gone for a 2-year period in Richmond with no rabies at all, then in the suburbs there appeared one or two cases, which spread with great rapidity until it covered the entire city. There were three or four hundred dogs with the infection—fortunately no human cases. There was issued an ordinance at that time, compelling muzzling or confining of all dogs, and it seemed as though the dogs could read the ordinance, because there was an immediate decrease in the disease. What we think helped largely was the fact that the city put on extra dog-catchers, and almost completely rid the city of stray dogs. The stray dog is, of course, the real menace.

Dr. Howell, Springfield, Ill.—In 1923 in Illinois our rabies troubles began just as they did in Indiana. The first year, the trouble was confined to the southern part of the state, coming across the Wabash River. Gradually it spread northward. It has now reached the northern part of the state, and the city of Chicago is getting each month as many positive dog heads as it had for an entire year formerly. In the southern part of the state, the disease is falling off.

By plotting the cases geographically, and comparing your monthly returns with the normal rates, you can pretty nearly predict how long your epidemic is going to last. We have just passed through the time of year—August and September—when rabies should be at its lowest. However, Chicago has had a rather sharp increase during those months, indicating that next spring, perhaps, there will be a

very marked increase in the disease there. It would seem that they cannot expect a decrease until a year after next, unless stringent measures are taken. The southern part of the state will rapidly clear itself of the disease, I believe.

The matter of the stray dog interested me, and therefore, with every positive head we have, we send out a little slip to find out how many other dogs had been bitten, etc. Just before I came to Cincinnati, I tabulated my results and received 75 answers. Thirty-five of the dogs that had been examined in 4 different laboratories in Illinois were strays, and the owners of the remaining 40 were known. The 75 dogs had bitten 58 persons, 136 other dogs and 14 other animals, such as horses and cattle. The stray dogs may have bitten more dogs than those of which we have a record, but it is pretty easy to check up the number of people bitten, because we hear of those. It would seem that the stray dog is of great importance in disseminating the disease among other dogs, and not as much of a menace to people.

Dr. Shorc—Rabies has always had a very unique interest in that it so completely differs from all other known diseases. We know more about it than we do about any other disease, and the feature which I want to emphasize here is that we know exactly how to exterminate it. We do not know that about any other disease, unless possibly it is yellow fever, and it is not very much of a compliment that we have such a large amount, and that only such countries as Russia and India exceed us greatly in numbers.

The International Conference on Rabies which was held in April discussed this disease from several angles. The resolutions adopted at that conference have been put into print. I think, among those resolutions, the most important was the last paragraph which read something like this: That the Conference believed and was agreed that rabies could be exterminated only by the restriction of the liberty of the dog unless muzzled or confined to the premises of the owner, and the extermination of the ownerless dog and it moved that the resolution be embodied in all the countries in the world. This has already been done in Great Britain and in the Scandinavian countries. That is the only way that we are going to get rid of the disease here. We know it is absolutely impossible to get every dog vaccinated and to vaccinate them every year. It is also going to be very difficult to pass and enforce adequate dog laws in this country, but it is less difficult than to attempt universal vaccination.

One other point in relation to the treatment paralysis, which is very distressing when it occurs—I think it is very important that when this accident does occur, and when it is so unfortunate that it results in death, that an autopsy be secured, if possible, in order to determine if we can the real nature of this treatment paralysis. A boy developed paralysis on the 16th day of treatment. He had been very badly bitten in the face, but treatment was advised, and I saw him on the 5th day of the disease. He died, and an examination of his brain showed that he had meningitis. It was impossible to diagnose the disease during life, and this diagnosis was further complicated as a spinal puncture had been made.

The Administrative Control of Communicable Diseases*

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THIS is a broad subject. Three official agencies, federal, state and local, are concerned in the administrative control of communicable disease. Although their services overlap, this discussion will be confined more especially to communicable disease control as administered by the small municipal or county health department.

Although we speak of the control of communicable disease, what we really mean is the attempt to control human beings (or animals) already suffering from disease or conditions which if not controlled may lead to their infection.

As our knowledge has increased in regard to the natural history of certain communicable diseases, our methods of control have improved. Because of their varying character, no two communicable diseases can be dealt with by identical methods of administrative control.

Despite this fact, certain general principles can be laid down as essential in any fairly comprehensive attempt toward sound administrative procedure. These of necessity may vary somewhat in detail, depending on particular circumstances.

The health officer of the local unit must have from the medical profession or other sources, prompt notification of the presence of communicable disease, and he in turn should furnish to the profession, directly or indirectly, clinical and laboratory diagnostic aids in order that early diagnosis may be made of suspicious cases. When a case is reported, the executive officer or one of his staff should visit promptly:

1. To isolate the patient either at home or in hospital
2. To quarantine or supervise, as the situation indicates, both immediate and remote contacts
3. To placard the premises and instruct the householder
4. To make such investigations as to the source and mode of infection as the circumstances may warrant, not only that the source of infection may be discovered but that further spread of infection may be stopped
5. To collect the essential epidemiologic data and file them as a permanent record

* Read before the Health Officers Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 18, 1927.

In addition, the live health officer will maintain close coöperation not only with the medical profession, but with the school authorities and all unofficial agencies.

If the local health officer functioned as outlined above and reported the case to the central authority, with comment if indicated, his local unit would inevitably receive a relatively high rating from the point of view of efficiency. But such a local unit is extraordinary. The unit that I have peculiarly in mind is ordinary. It has done two things when the case was reported, placarded the premises and mailed a report of the case to the central authority. It will, no doubt, "fumigate" when "the card comes down," a form of worship in terms of burning incense to the false gods of gaseous fumigation still in vogue. You have no doubt heard it said of some kindly, garrulous, old gentleman, who was in his anecdotage, that he was simply "living in the past." It seems that there are a good many small health departments still living in the past.

It is true that fifty years ago "a warning sign" plus fumigation when the case was released from quarantine gave satisfactory evidence, by means of sight and smell, to the interested public that the board of health was functioning perfectly. It is true that antagonism toward boards of health was engendered by the rigidity of quarantine and the show of authority which was part and parcel of our old control procedures. But fifty years ago little or nothing was known about infectious diseases. Although what we still have to learn at times fills us with dismay, the advance in our knowledge of these diseases has been remarkable. We have adapted our administrative procedures somewhat to this newer knowledge. We use coercion less and coöperation more. We depend on medical supervision in the control of contacts and give considerable latitude to proven immunes. Finally, with artificial immunization we are on the way toward the soundest possible method of communicable disease control.

While we must still consider certain factors of control concerned with the environment, especially water supply, sewage disposal, and the supervision of milk and other foods, we are now concerned more with the individual than with his environment. For some years most of us have believed that "sanitary instruction is even more important than sanitary legislation."

The larger and better organized health departments have quietly met the demand for individual instruction in connection with communicable disease control by means of the public health nurse. How have the small local departments met the challenge? A few have, with courage and good judgment, appointed nurses as executives and a few more have met the situation by combining the activities of a school

nurse with those of a communicable disease nurse. The argument against the use of a communicable disease nurse in a small place, except for its greater intensity, is similar to arguments which have been advanced in larger areas, namely, that she may be a carrier of infection. This question was fully discussed in the April, 1926, number of the *JOURNAL* of this Association.¹ There may still be argument against the utilization of a nursing service in connection with communicable disease control, but it seems to me that those who will continue this argument, will also continue to argue in favor of gaseous fumigation.

The nurse undoubtedly has a definite place in the administrative control of communicable disease. Is there an informed opinion among the householders of your small localities and mine about the actual means of spread of the common communicable diseases of childhood? The need for individual instruction in the few sound methods of communicable disease control is a crying one indeed. As I see it, we need more sense and less nonsense in connection with our efforts to control infection both within and without the household. How many mothers in small places understand the purpose of isolation and quarantine? Do families in your small towns never have secondary cases following a case of typhoid fever in the household? Do the mothers in all your smaller communities know that measles and whooping cough are especially fatal diseases in children under 3 years? Is concurrent disinfection actually carried out in connection with isolation of communicable disease in such places? Finally, are the mothers in this type of locality fully comprehending the value of artificial immunization? The answer to all these questions for the majority of our smaller communities is "No."

The gap between what we know and what we want our citizens to know is tremendous. What an opportunity to "put over" all this individual instruction by means of the public health nurse. At no other time is the mother so responsive to instruction as when one of her family lies ill of some communicable disease. With instructive home visits, it would soon become common knowledge that with a few exceptions communicable diseases are spread by the route that infected body discharges take from the patient or carrier to the susceptible individual. Perhaps a slogan might be developed for such a nursing service which might run like this, "Preaching as she placards," teaching that "people, not things, spread disease."

One constantly hears of the lack of funds in any health department, but the small municipality or county is especially hampered in any attempt to develop even a minimum of health service. A communicable disease nursing service, however, may be developed either as a full-

time, or part-time service in combination with school, tuberculosis, or other community nursing service. With such an arrangement there is possible a maximum of service at minimum expense. Upon this service and its development rests the ultimate success of communicable disease control in the smaller places.

I am by no means concerned with the "glorification" of the public health nurse. Yet the nurse has demonstrated her effectiveness in other phases of public health activity. However important proper training may be, the successful nurse in addition usually has the reputation of accomplishment, plus the peculiar power of making friends not only for herself but for the organization for which she stands. This is of more than passing importance. Health departments as they go have no host of friends among the householders. Too many health departments have forgotten that the householder has a soul and a mind, as well as a body. Fortunately the nurse has the happy faculty of ministering to the souls and minds of the people as well as to their bodies.

Unless the health officer or the board of health is able to reach the individual with information and instruction upon which the citizen may build for himself a course of hygienic conduct in order to escape infection, there must of necessity be futility in our administrative practices in communicable disease control.

CONCLUSIONS

Small municipal or county health departments organized with sound administrative procedures in mind do function efficiently in the control of communicable disease. These, however, are in the minority. The great majority fail to function at all, usually because of the lack of training of the executive officer, his lack of interest and vision, or both.

The use of a public health nurse either as an executive officer, or in the capacity of a communicable disease nurse, full or part time, will furnish a maximum of service at a minimum of expense.

Unless there is informed public opinion in regard to the purpose of our procedures in communicable disease control, superstition and ignorance will be constantly in conflict with scientific enlightenment.

The nurse is peculiarly fitted to carry into the homes the story of how to avoid infection and to interpret to the householder the purpose of isolation, concurrent disinfection, quarantine, and artificial immunization.

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Pneumonia Quarantine*

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THE CONTROL of the morbidity and mortality of pneumonia is a major public health problem. Pneumonia ranks first in the list of acute, communicable diseases as a cause of death.

DEATHS IN 1924

Smallpox	900	Measles	8370
Infantile Paralysis	1128	Whooping Cough	8385
Scarlet Fever	3109	Diphtheria	9756
Typhoid Fever	7212	Pneumonia	108700

Prior to 1924, no concerted effort had been made in preventive medicine to control pneumonia, though the contagiousness of pneumonia seems to have been recognized as early as 1497 by Savonarola of Venice. Dunns in 1592 wrote that peri-pneumonia is a contagious disease, because he observed that it attacked many in the same family. Vaughan¹ states: "All students of epidemiology recognize that the pneumonias are infectious diseases and are disseminated by spitting, sneezing and coughing." Rosenau² states: "Lobar pneumonia is a communicable disease which should be classified with the infectious fevers."

In the year 1923 and early in 1924, many consecutive cases of pneumonia in a household were reported to and investigated by the Pittsburgh Department of Public Health; and during March, 1924, 22 such cases were found in which a direct, intimate contact with a primary case and second or subsequent cases of pneumonia were found by investigators of the health department to be authenticated.

Riesman,³ in discussing pneumonia quarantine, says:

In the past, we have attacked pneumonia from the standpoint of the individual, just as we have attacked—and with about as much success—the common cold. We have looked for medicinal specifics, for prophylactic vaccines, for therapeutic

* Read before the Health Officers Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 19, 1927.

NOTE: Owing to the death of Dr. C. J. Vaux, Director, Department of Public Health of the City of Pittsburgh, in April, the presentation of a paper on Pneumonia Quarantine was submitted to me at that time as I had been in his council and worked with him on this subject since its inception in Pittsburgh, and, in presenting this paper I cannot do any greater honor to him than to use his language in many places and beg your indulgence if I do so.

serums, and yet, though all these efforts are deserving of praise, pneumonia is almost as devastating a disease as it was before they were begun. Let us see whether the position that pneumonia should be a quarantinable disease is well taken.

We can get a clearer answer to this question if we consider the reasons in the past that have deterred physicians from considering the disease one that can be influenced by quarantine.

Pneumonia seems in many instances to begin explosively (after a wetting or chilling), suggesting that it is an autogenous and not a heterogenous infection. When, however, we study carefully the history of pneumonia patients, we find that many had a slight, preliminary, neglected cold. This was found to be true by the Philadelphia Pneumonia Commission, and is my personal experience in private and hospital practice. Therefore the hypothesis that the abrupt onset militates against infection from another source is very much open to question.

The second reason that made men doubt the transmissibility of pneumonia is the rarity of contact infection. That point too has lost much of its force. In the first place, contact infection occurs though it may not be frequent. The other day, I was informed of a pathetic instance in one of the seashore towns of New Jersey. A physician fell ill with pneumonia. His son, a student in a New England college, was called home. The father died, and within a few days the son also died of pneumonia. Every practicing physician can recall in his own experience double or triple cases in the same household. Dr. James M. Anders, in his study of pneumonia in Philadelphia, found the highest death rate in the most densely populated parts. Dr. Frederick T. Lord has collected a number of other examples of indubitable contact infection.

We may also answer the objection with regard to contact infection by an analogy. Tuberculosis was looked on until our own time as an hereditary but not a contagious disease. Only after Dr. Flick had published his epoch-making researches on tuberculous houses did the contagiousness of the disease and the fact that tuberculosis in a given individual invariably harks back to some other tuberculous individual, gain general acceptance. And yet, actual contact infection in sanatoriums or hospitals is not common; otherwise, the contagion theory would not have had to fight its way.

The third reason that has delayed the institution of quarantine in pneumonia is the prevailing belief that the pneumococcus is a more or less constant inhabitant of the human mouth. If this were the case, then quarantine could serve no useful purpose. But is it the case? I think bacteriologists are now generally agreed that the pneumococcus found in healthy persons is nearly always a nonvirulent micro-organism or one possessing but slight virulence. The highly virulent types, those responsible for the majority of the cases of pneumonia, are found only in the pneumonic patient or in the occasional carrier, an individual who has either recently recovered from pneumonia or has been in close contact with a pneumonia patient. That is the view of such distinguished authorities as Park and Williams⁴ and of Bigger⁵ and of Dublin. The latter expresses the unequivocal opinion that pneumonia is transmitted usually from a definite case of pneumonia or sometimes from a healthy carrier previously in contact with a pneumonia patient.

One other point of importance should be mentioned, since it has a bearing on the obscure problems of pneumonia transmission. The pneumococcus is a fairly tenacious organism. In sputum attached to clothes and not exposed to direct sunlight, it may retain its virulence as long as 55 days. Direct contact is therefore not

essential, since transmission can be brought about by surviving germs whose presence and source may not be suspected.

Perhaps there is also conveyance through non-human sources, through animals, milk, etc. While little is known about this, it is a point deserving investigation. It should furthermore be remembered that the pneumococcus is responsible for many cases of simple bronchitis, and might gain in virulence in its passage through the bronchitic patient.

When we consider the facts I have mentioned, we cannot help giving our adhesion to the proposal for a modified quarantine in pneumonia. It is a logical procedure, based on those epidemiologic grounds that have guided us toward quarantine in other infectious diseases.

Pneumonia quarantine was inaugurated in Pittsburgh on April 1, 1924, because some method was necessary to cut down the unenviable record we had of being the highest in pneumonia deaths as reported by the Department of Commerce, Washington, D. C., in a report dated January 12, 1924, embracing 72 cities, and giving Pittsburgh a rate of 371 per 100,000. We appreciated all the technical, statistical questions involved in comparative figures, and also had been watching the steady rise of pneumonia in the last ten years. In a preventive way, nothing had been done to reduce this incidence.

Based on the assumption that pneumonia is an infectious disease, a plan to have all pneumonias reportable and to place a quarantine on every case was inaugurated on April 1, 1924, appreciating that no more can be expected from quarantine of pneumonia than from quarantine of any other infection, and that the real value would be in preventing many persons from contracting the disease who otherwise would have been exposed.

The plan of quarantine and isolation was endorsed by the County Medical Societies of Allegheny County.

In Pittsburgh, the regulation covering reports of cases of pneumonia was made all inclusive in order to avoid any loophole for failure to report a case. The regulation follows:

Pneumonias (all forms) are reportable diseases in the City of Pittsburgh; specify (a) lobar pneumonia; (b) broncho pneumonia; (c) pneumonia complicating influenza; (d) pneumonia complicating other communicable diseases; (e) all other pneumonias, as traumatic, anaesthetic, senile, etc.; specify whether lobar pneumonia or broncho pneumonia in all of the above primary conditions.

Actual quarantine in certain types of cases is optional with the Department of Public Health; also, the quarantine regulation is a modified quarantine, as follows:

Modified quarantine will be enforced in all cases of pneumonia, except that under the classification "e" ("all other pneumonias, as traumatic, anaesthetic, senile, etc.") which may be quarantined, at the option of the Department of Public Health. This modified quarantine will consist of placarding, isolation of the patient,

prohibition of all visitors, but no restrictions on other members of the household, including school children, provided isolation is complete and instructions from the Department of Public Health are properly carried out. No minimum number of quarantine days specified, the quarantine period being until recovery or death of patient.

Complete sanitary cleaning of the premises is required before release, but, when this is accomplished thoroughly following the physician's report of recovery, quarantine release is made at once. In a fatal case, after sanitary cleaning, no funeral restrictions are made. Regulations governing pneumococcus carriers or laboratory release regulations were not incorporated. This may be a desirable later step, but at present, because of the apparently beneficial effect in reducing the number of cases and deaths from pneumonia and the complete approval accorded the regulation by the physicians, hospitals and citizens of Pittsburgh, the present pneumonia quarantine regulations have been satisfactory and will continue indefinitely.

When this plan went into effect, in every case reported from a private home, a Department of Public Health nurse made an investigation of the patient: age, sex, color, nativity, occupation, living conditions, contacts in house, and a history as to precedent exposure to a case of pneumonia, bronchitis, influenza and cold, and whether or not the present pneumonia was subsequent (in five days) to a prior cold or illness of the patient.

In 5277 cases so investigated, it was found that 3808 or 72 per cent gave a history of preceding "cold" or grippe, so-called. No causes were included where the attending physician made a diagnosis of influenza as the primary disease.

The reaction of the public laity and the medical fraternity to this pneumonia regulation has been a pleasing factor. At no time did we have anything but the wholehearted, earnest support of both to this work. This first step—reporting and quarantine—is a valuable aid in pneumonia prevention and has stimulated the second step in prevention—that of arousing public interest by making the public cognizant of the danger of pneumonia and reasons for regulations and results obtained. There has been no single complaint regarding pneumonia quarantine regulations by lay citizens or physicians; on the contrary, many commendatory letters have been received from hospitals, physicians, lay public and civic organizations, all indicating endorsement of the plan and willingness to coöperate.

In the summary appended, showing cases and deaths since 1923 by months, it will be noted that prior to the establishment of our reporting and quarantine regulations the number of pneumonia deaths was in

excess of the number of pneumonias reported, and that since April 1, 1924, the contrary is true. The pneumonia incidence shows a decided drop and is so reflected by the deaths, taken year by year or by months of each year; and, while it is too early to pass conclusions definitely, from all indications, pneumonia quarantine has had some material effect in reducing the incidence in Pittsburgh.

There are many infectious, environmental, personal and climatic factors regarding the epidemiology of pneumonia which are worthy of intensive investigation and study. There is the purely medical question, with laboratory investigation, typing of cases and contacts, and the finding of the relationship of "common cold," grippe, fatigue, etc., to pneumonia.

The other aspect is of an engineering or industrial type, and has to do with heating, ventilation, living quarters, transportation, working conditions, climatic factors, fog, smoke and air pollution. The fact that the percentage of pneumonia deaths in cities is about 50 per cent greater than in rural districts may be due to greater contact or to some of the above factors.

CASES AND DEATHS—PNEUMONIAS (ALL FORMS)
PITTSBURGH, PA.

		1924	1925	1926	1927
January	Cases	112	520	298	443
	Deaths	204	210	122	157
February	Cases	92	526	311	326
	Deaths	238	195	114	113
March	Cases	194	646	676	474
	Deaths	405	260	214	172
April	Cases	559	496	480	326
	Deaths	219	177	166	109
May	Cases	311	281	181	261
	Deaths	142	104	97	115
June	Cases	203	179	145	157
	Deaths	85	78	64	71
July	Cases	111	85	97	
	Deaths	63	41	42	
August	Cases	108	112	58	
	Deaths	47	62	31	
September	Cases	153	126	76	
	Deaths	68	55	37	
October	Cases	276	212	124	
	Deaths	111	80	55	
November	Cases	371	329	181	
	Deaths	139	126	62	
December	Cases	370	297	233	
	Deaths	136	123	100	
<i>Total</i>	Cases	2860	3809	2860	1987
	Deaths	2074	1688	1255	737

Having the first two steps—reporting and quarantine, and rousing public interest—the third step should be organized study in centers of population as to all the factors in causation and control of pneumonia by a pneumonia commission with funds sufficient for a study over years and collaboration with similar commissions in other centers. Such a commission has been advocated in Pittsburgh, and we are in hopes that it soon will materialize and carry out the project so ably and fearlessly inaugurated by the pioneer in pneumonia quarantine, Dr. C. J. Vaux.

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Infant Mortality and Infant Welfare in Prussia

ACCORDING to an official report, the birth rate in Prussia in 1926 was 19.6 per 1,000 population, whereas in 1925 it was 20.9. The infant mortality rate in 1926 was 101 per 1,000 live births, whereas in 1925 it was 104. Infant mortality, which has been decreasing for some time, reached in 1926 the lowest level ever observed. This decrease is attributed not only to the decrease in the birth rate, but mainly to the more extensive welfare work and education of the people in infant hygiene.

Breast feeding, which has become quite prevalent since the war, is being encouraged by payment of nursing benefits by the government.

Infant health was reported to be good in most provinces. Of the approximately 15,000 infants examined in 1926 at health centers in a number of cities, 14.1 per cent were found underfed; in 1925 the percentage was 15.6, and in 1924 it was 25.

A further decrease in the number of cases of rickets was noted and severe forms were rare. Among the infants examined in 58 cities and rural districts in Prussia, 10 per cent were found to have rickets in 1926; 20 per cent in 1925, and 23 per cent in 1924.

The shortage of clothing was found to be less prevalent than in the previous year.

The number of infant health centers rose from 2,847 in 1925 to 3,115 in 1926. Infant welfare work by the municipalities and private agencies included distribution of literature on infant care and of milk, cod liver oil and similar articles. In addition, babies' outfits were loaned to needy mothers, and premiums were given for regular attendance at health centers.—*Volkswohlfahrt*, Berlin, Feb. 1, 1928, vol. 148.

Resistance to Pneumococcus Infection as Influenced by Breathing of Gas Combustion Products*

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IN the symposium on acute respiratory diseases held at the Cleveland meeting of the American Public Health Association, October 17, 1922, Vaughan and Palmer¹ divided the pneumonias into three types, viz., *epidemic*, *sequel* or secondary, and endemic or *seasonal*. They also showed that the seasonal form has a distinct cycle with, for instance, 43 per cent occurring in the first three months of the year, 24 in the second three months, 10 in the third three months, and 23 in the last three months; also that this ratio is maintained, with slight modification only, year after year. These authors likewise presented statistics to show that the behavior of pneumonia is peculiar in that cities suffer fully a third more than country districts, but that there is a vast difference in cities—a city like Pittsburgh having a ratio of 275 as against 140 for Cleveland, while 16 per cent of the deaths in Pittsburgh were attributed to pneumonia as against only 8 per cent in San Francisco. In the 25-year period from 1864 to 1888 the combined rates for several large cities in the country showed a mortality of 189, or 7 per cent of total deaths, but in the next 25 years this rate was 232, or 12 per cent of total deaths in these cities. It will be seen from the above that there is good statistical evidence pointing to atmospheric pollution by combustion products as a possible explanation for increased pneumonia death rates under certain conditions.

In 1922 Oppenheimer and Spaeth² reported the practical success of a method for determining susceptibility to one of the forms of pneumonia by the injection of a culture of Type I pneumococcus obtained from the diagnostic laboratory of the New York State Board of Health, which could be so controlled that the minimum lethal dose could be determined. Their method was to make intraperitoneal injections of salt solution suspensions of the culture. By the use of this method they

* Read before the Industrial Hygiene Section of the American Public Health Association, at the Fifty-sixth Annual Meeting at Cincinnati, O., October 19, 1927.

announced that fatigued white and hooded rats were less susceptible to pneumococcus infection than non-fatigued rats.

Later in the same year Spaeth¹ reported similar findings for guinea pigs. Incidentally, Spaeth also found that pneumococcus grew as well in the blood from fatigued animals as in the blood of control animals, showing that the protective factor apparently produced by fatigue was not in the blood itself. Later in the same year Nicholls and Spaeth² reported other experiments with like conclusions, "that fatigue definitely increases the resistance of these animals (guinea pigs) to lethal injection of Type I pneumococcus."

In 1925, the year in which Spaeth³ lost his life while collecting material in the Siamese jungle, where he contracted an infection, he further reported as a result of the same method of investigation that good physical condition appears not to include the resistance to infection and that young starved guinea pigs and exhausted pigs resist infection better than do normally fed control pigs because of the weight recovery process or increased anabolic rate, and that the factor concerned was not fatigue nor fatigue products but "that natural resistance is a function of anabolic rate."

It has been our purpose to apply the method of Spaeth and coworkers to determine the resistance to pneumonia in the matter of breathing combustion products, as from chimneys, poorly ventilated furnaces, unflued gas stoves within the home, etc.

To our knowledge no experimental evidence has yet been offered showing a disturbance in natural resistance to pneumonia under these circumstances. While, as stated above, vital statistics plainly point to such a relationship, direct evidence is apparently lacking. Our investigation has, therefore, been an attempt to supply some direct evidence. In truth, it is barely possible that such exposures may increase the resistance to pneumococcic infection by increasing the anabolic rate, such as Spaeth found in connection with fatigue and with starvation. Our investigations have been open to either finding.

ARRANGEMENTS

On March 29, 1926, we were awarded Grant 87, \$500.00, by the Committee on Scientific Research of the American Medical Association "to determine by the experimental method, using lower animals, the effect of breathing combustion products of ordinary carbonaceous fuels (e.g., coal, oil, gas) upon the susceptibility to pneumonia, using a known dosage of a known type of pneumococcus for inoculation into exposed and controlled animals."

The research was undertaken with the coöperation of the Depart-

ment of Bacteriology (in charge of Dr. George B. Morrey), the Department of Metallurgy (in charge of Prof. Dana J. Demorest), and the Department of Public Health (in charge of the writer)—all departments of the Ohio State University; and after July 1, 1927, with the added assistance of the Division of Laboratories of the Ohio State Department of Health.*

The investigation got under way June 17, 1926, and continued to October 28, 1927, with equipment set up first in a ground floor laboratory of Lord Hall, and after July 1, 1927, because of building alterations, removed to the State Laboratories, also on the Campus.

METHODS, SCOPE AND COMMENTS

Small batches of white rats—4 to 19 in number in various runs—were housed in a tight box, partly glassed and having openings for inlet and outlet ventilation which could be controlled. The rats lived day and night in an atmosphere surcharged with the completely oxidized combustion products emitted from a large gas burner of the Bunsen type, which stood on the laboratory floor. Natural gas, containing no carbon monoxide, was used. An average composition of this gas analyzes as follows (Burrell)⁶:

<i>Gas</i>	<i>Per Cent</i>
Carbon dioxide (CO ₂)	Trace
Methane (CH ₄)	84.7
Ethane (C ₂ H ₆)	9.4
Propane (C ₃ H ₈)	3.0
Butane, etc. (C ₄ H ₁₀)	1.3
Nitrogen (N ₂)	1.6

The products of this burner, mixed with controlled proportions of air, were collected in a superimposed funnel connected to a 3 inch iron pipe. This pipe which was several feet in length was cooled by a stream of tap water constantly running over it. This pipe entered a sub-compartment of the exposure box, whence the gases passed up through small openings in the floor of the exposure box. A continuously recording thermometer and a hydrometer were placed in the box where their readings were visible from the outside; also a room thermometer, on the box. Control animals were simply kept in the usual wire cages in the same laboratory. Temperatures in the exposure box were kept as comparable to the general room temperature (ranging from 53° to 88° F.) as possible. Control animals were not confined in a closed box which would not have paralleled the exposure box in which the ventila-

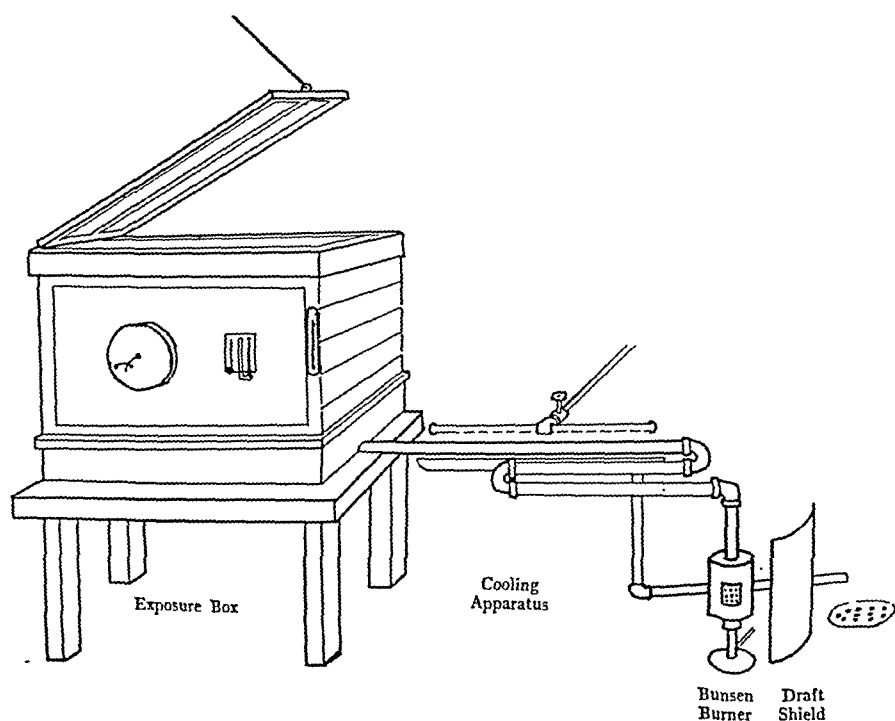
* Those who participated in the research directly, though at different periods as a rule, were George W. Bond, instructor in bacteriology; Andrew J. Kardos, graduate student in bacteriology; Dr. R. F. Jukes, instructor in bacteriology; Leo Eye, chief bacteriologist, State Laboratories; Fred Berry, Director of State Laboratories, and K. K. Koontz, metallurgist with Prof. D. J. Demorest.

tion was positive and fairly active. All cages were cleaned once daily when the lid on the exposure box was opened and the atmospheric condition temporarily disturbed. Abundant food was supplied to both groups.

Analyses of the products were made for carbon dioxide, oxygen, and carbon monoxide, although it was the intention to keep carbon monoxide absent. Various atmospheric compositions were easily maintained as desired, although on two or three occasions in the early months of the investigation monoxide was produced and promptly killed the rats under exposure.

It was first necessary to feel out the tolerance of the rats, using both sexes, and medium to large sized animals. This was done by gradually increasing the percentages and lengthening the periods of exposure to the combustion products indicated. This part of the investigation occupied the first 10½ months, or until April 30, 1927. It is to be noted that Hermans' demonstrated that an atmosphere containing 15 per cent of oxygen and 2 to 4 per cent of carbon dioxide is not toxic. Such would especially apply to burrow animals like the rat.

After having sensed out the tolerance to various concentrations with both high and low temperatures, and over many days of exposure,



animals were inoculated intraperitoneally with a strain of the same Type I pneumococcus (obtained from the New York State Laboratory) as was used by Spaeth and his coworkers, above referred to. Our bacteriologists found the m.l.d. of this strain difficult to control or rather to maintain when once found, so that there was constant danger of killing all the rats—both exposed and control—or of killing none in any given inoculation series.

Space does not permit of the inclusion of the protocols and other data of the various runs and inoculation experiments, but copies of same are available to those interested. In all, 7 tolerance experiments varying from 21 to 111 days and 3 inoculation experiments were made. A typical example of a tolerance experiment is given herewith:

EXP. H.—*Tolerance experiment (similar to Exp. C)* followed by third inoculation experiment*

This experiment got under way with new and improved equipment July 9, 1927, the plan being to run an exposure of at least 100 days under the same general conditions as the two preceding experiments (F and G). A batch of 19 young adult white rats was put into the exposure box. The controls consisted of 8 similarly aged normal rats.

TABLE I

TOLERANCE EXPERIMENT (SIMILAR TO EXP. C)* FOR 111 DAYS.

Dates	No. of Days	No. of Rats	CO ₂ Per cent	O ₂ Per cent	Temperature Range	Remarks
{ July 9	111	Exposed:	3.4	13.8	{ (a) Exposed: 53°-88° F. Control: room summer temperature	3 rats died in first 2 days. These were replaced on 4th day
{ Oct. 28		19	to	to		
		Control: 8	4.0	15.1		
July 18						Litter of young born in exposure cage
July 20						Young rats apparently eaten by others in cage
July 27	18					1 exposed rat died
Aug. 8	30					2 exposed rats died
Sept. 10	63					1 exposed rat died
Sept. 15	68					1 control rat died
Oct. 1-24	83-107					4 exposed rats died
Oct. 28	111					11 exposed rats remain 7 control rats remain

* Determining tolerance under markedly abnormal atmospheric conditions but within room temperature ranges.

On post-mortem none of the rats showed evidences of pneumococcus infection. The lungs were apparently normal. The cause of death was undertermined.

Comment—It will thus be seen that 8 of the 19 rats placed in the exposure box died during the period of 111 days, during which time only one of the 8 control rats died.

INOCULATION EXPERIMENTS

EXP. F. *First inoculation experiment* (April 30, 1927)

Here the 4 long-exposed rats (61 to 175 days), the 3 other exposed rats (26 days), and the 7 control rats remaining (mentioned in Exp. E), were inoculated by intraperitoneal injections, using 50,000 pneumococci per gram of body weight.

Results:

Six out of the seven exposed rats died within 48 hours of the time of inoculation. Of the control rats, one died out of the seven inoculated.

A further pair of control rats was inoculated at the same time, using twice the dosage of pneumococci. Both of these rats died within 24 hours, showing the potency of the suspension used.

All the dead rats were examined at autopsy and cultures from the heart's blood taken. The cause of death in each case was septicemia and peritonitis; lungs crepitant throughout and the separate lobes floated freely on water.

Second inoculation experiment (May 26, 1927)

The same strain of Type I pneumococcus used in previous experiments was injected by the intraperitoneal route. This strain was, however, of a lower virulence and was found by tests to require a heavy dosage to kill, which it did ordinarily in 48 to 72 hours instead of within 24 hours. This was considered an advantage. One c.c. of standardized suspension in salt solution was injected per 100 grams of body weight:

One rat only of the exposed group died; this was on the second day.

One rat only of the control group died; this was on the third day.

On autopsy, pneumococcus was isolated in pure culture from the heart's blood in each case. No gross evidence of pneumonia.

None of the remaining inoculated rats in either the exposed or control groups died. They were alive and in good condition on the sixth day.

Comment—From this experiment it can only be concluded that, in the face of preliminary virulence tests, lethal doses were not used. Also it is possible that there was no material difference in susceptibility in either of the groups because the period of exposure for the test group—21 days—may have been too short. Possibly both factors were operative. At all events, the results were unsatisfactory from any point of view. The experiment, however, shows the difficulty encountered on the bacteriological side of the question in developing a just-sub-lethal dose for normal rats.

Third inoculation experiment

The 11 exposed rats remaining and the 7 regular control rats, to which 4 new rats were added to bring the controls up to 11 rats for inoculation purposes, were inoculated on the afternoon of October 28, 1927, and the animals returned to their respective quarters. In order to be certain that no changes of a lethal character might supervene in the gaseous exposure mixture and thus inadvertently kill off the inoculated exposed rats, a second cage of 6 normal rats was also placed in the exposure box. These 6 rats remained in good condition up to the time the last test rat was taken out, i.e., 89 hours following the inoculation.

The same strain of Type I pneumococcus used in the previous experiments was

again employed. Preliminary tests through several series of rats showed that the strain had increased in virulence since the last inoculation experiment, May 26, 1927—156 days prior. Following Spaeth's method of a definite routine in the animal passage, incubation of the freshly isolated culture, storage of this culture in the icebox, and preparation of a new culture for injection, both saline and broth suspension were obtained such that 0.001 c.c. per gram weight killed one out of three rats in each test experiment.* As the result of numerous preliminary tests, it was felt this was as near the desired result as could be obtained. Therefore, 0.001 c.c. per gram weight of animal of the saline suspension was utilized for the final test series.† Injections were made intraperitoneally as before. The results of the inoculations are shown in Table II:

TABLE II

THIRD INOCULATION EXPERIMENT

<i>Time following inoculation</i>	<i>Exposed rats</i>	<i>Control rats</i>
21 hours	2 died	
27 hours	1 died	
34 hours		1 died
40 hours	3 died	
42 hours		1 died
48 hours	1 died	
55 hours		1 died
70 hours		1 died
72 hours	3 died	
76 hours		1 died
82 hours		1 died
89 hours	1 died (the last one)	
100 hours		1 died
5 days		1 died
7 days		1 died
8 days		1 died
26 days		1 still alive
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	Total 11 rats	11 rats
		Median time of death—40 hours.
		91 hours.

Of the *exposed* rats, 5 were males, 6 were females. Their average weight before injection was 185 grams; average weight after death 167.4 grams. These rats showed a steady decline in physical conditions in each case following the inoculations until death occurred.

Of the *control* rats, 6 were males, 5 were females. Their average weight before injection was 200 grams; average weight after death of 10, plus the one rat which remained alive, was 182 grams. The first 3 of these rats to die showed a steady decline following inoculations until death occurred. With the remaining 8 rats, a distinct rallying period occurred after about the 60th hour. They began to eat and to move around, so that recovery seemed imminent. However, they later slumped, except one which survived throughout, and died at the hours or days stated (see Table II).

Upon post-mortem, 5 of the 11 exposed rats, and 2 of the 11 control rats showed a distinct purulent broncho-pneumonia, although the lung tissues floated in water

* In the case of the saline suspension, the rat showed signs of physical decline on the third day and died in 5½ days. With the broth suspension, the rat died on the third day.

† The standardized saline suspension contained 5 billion pneumococci per c. c.

in all cases. Smears made from the heart's blood showed abundant pneumococci in all cases.

Comment—From this experiment it will be seen that:

1. Eight out of the 19 exposed rats died during the period of 111 days' exposure to the combustion products of the Bunsen burner (as described), whereas only 1 out of 8 control rats died during this period. Post-mortems failed to explain this increased tendency to die, but pneumonia was not the cause.

2. Ten of the exposed rats which were also inoculated with the standardized dose of Type I pneumococcus died within 72 hours, as against only 4 of the control rats similarly inoculated; also the latter showed a tendency to recover provided they lived after 60-70 hours, and 5 survived for 5 or more days. It is evident also that despite the preliminary tests for virulence of the saline suspension used, the dosage was ultimately lethal to the normal (control) rats.

SUMMARY OF INVESTIGATIONS

1. Through the coöperation of a number of scientific agencies an investigation was made to determine the susceptibility to pneumonia on the part of white rats as influenced by the breathing of completely oxidized combustion products from a carbonaceous fuel, viz., fumes from a Bunsen burner using natural gas (which contains no carbon monoxide). The conditions simulated the breathing of burned gas fumes in a room having an unventilated gas stove.

2. The intricacies of investigative work were bacteriological and metallurgical, and credit for same should be given to those named rather than to the writer.

3. Experiments to determine the tolerance to increasing amounts of the combustion products in question were started June 17, 1926, and continued to October 28, 1927. Here it was found that, where room temperatures prevailed (50°-88°F.), the experimental animal—the common laboratory white rat—is fairly tolerant for upward of 100 days and more to an atmosphere containing 3½-4 per cent carbon dioxide, 14-15 per cent oxygen, water vapor to saturation, and, in one experiment, to the addition of pulverized coal dust to the above for 35 days. With lowered temperatures (41°-68°F.) broncho-pneumonia appears to supervene readily.

4. In a collateral investigation it was possible to isolate a strain of Type I pneumococcus of fairly controllable dosage and to use this in three inoculation tests of white rats previously exposed for varying periods of time, viz., 90 days, 21 days, and 111 days, respectively, to the concentrations of combustion products indicated above. In this, our bacteriologists followed in general the method devised by Spaeth and coworkers of Johns Hopkins University in their studies of fatigue and starvation as related to pneumococcus infections. However, this difference in results occurred: where Spaeth reports lobar pneumonia, even with a critical period, following peritoneal injections, we found only occasionally purulent broncho-pneumonia, but chiefly septicemia (pneumococcemia) and peritonitis. However, death was due to pneumococcal infection.

5. The inoculation of our first experimental rats which had been exposed for periods varying from 26 to 175 days resulted in the death of 6 out of the 7 exposed, whereas control rats given similar dosages had but 1 death out of 7. A second experiment in which the rats were exposed for only 21 days resulted in indefinite findings since but 1 rat out of each group of 7 succumbed to the infection pointing to a sublethal dosage. A third experiment extending for 111 days and using an initial batch of 19 rats in the exposed group had 8 of the rats die during the period of exposure while but one of the control group of 8 rats died during the same period.

Furthermore, after inoculation of an unintentionally too virulent dose the remaining 11 exposed rats died between 21 and 89 hours (median 40 hours), without any signs of rallying at any time, whereas 10 of the 11 control rats died between 34 hours and 8 days (median 91 hours), several tended to recover, and 1 survived.

CONCLUSIONS

While we have direct evidence that rats are surprisingly tolerant of the prolonged breathing of completely oxidized fuel combustion products (as from an unventilated gas stove) rich in CO_2 and O_2 , etc., upwards of one-third of them die from undetermined causes during a period of exposure varying from a few to 111 days. Furthermore, upon inoculation of the remaining exposed rats with a standardized suspension of Type I pneumococcus, they succumb much more readily than do control animals, pointing to a lowered resistance as the result of such exposure. However, more experiments are needed to warrant definite conclusions.

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Warring Against Trachoma in Argentina

THE Argentine Red Cross is undertaking an active campaign against trachoma. A model dispensary for the treatment of trachoma in its early stages will be established in every school, and a body of Red Cross nurses who are specialists in the treatment of infections of the eye, coöperating with the national department of health, will examine the school children, visit them in their homes, demonstrate methods of prevention, report new cases discovered, and arrange for their examination and treatment. Lectures on diseases of the eye and their prevention will also be given for teachers and the general public.

Program and Preliminary Results of the Committee on the Grading of Nursing Schools*

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THE HISTORY of nursing education shows that progress in this field has generally come as a direct response to unusual services, rendered to an individual or to the community, by a nurse or group of nurses. It is natural and inevitable that society should wish to provide facilities for the training of a class, the value of whose service has been recently and clearly demonstrated. The most important single event in the chronicles of nursing education, the foundation of the training school at St. Thomas's in London, expressed the gratitude of the British people for the revolution wrought by Florence Nightingale; and throughout the land there is many a school which owes its strength to the appreciation by some influential individual patient of the skill and devotion of some individual nurse.

To the members of the Public Health Nursing Section of the American Public Health Association it must be a peculiar source of gratification to recall that the remarkable advances in nursing education which have been made during the past 5 years owe their inception in peculiar measure to a realization of the unique public service rendered by the public health nurse. It was the Committee on Nursing Education, supported by the Rockefeller Foundation, which took the first step in this recent forward movement; and this committee was originally constituted with an increase in quantity and quality of public health nursing as its primary objective.

I have called the report of this committee, and that of its executive officer, Josephine Goldmark, R. N., the first step in our recent campaign for the improvement of nursing education, and I believe this to be the case. For the first time in the history of nursing, a joint committee, including some of the most eminent physicians of the country, adopted without a dissenting voice a report in which, among others, the conclu-

* Read before the Public Health Nursing Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 19, 1927.

sions were drawn: that, while the use of a less qualified attendant might be justifiable and advisable in certain types of chronic illness and convalescence, the care of acute and serious illness and the teaching of hygiene to the individual in the home can only be safely carried on by a person of high educational qualifications; that the education given in the average hospital training school is often inadequate and irregular and unrewarding; and that this condition can only be remedied by providing funds for nursing education and direction of nursing education which will insure the pursuit of an educational aim—undeflected by demands of hospital administration which may run counter to such an aim. The committee report placed this fundamental issue clearly, and frankly, and with weight of medical and nursing authority, before the public. It led directly to the independent University Schools of Nursing at Yale and Western Reserve and it laid the basis, indirectly, for a general effort to improve the status of the education of the nurse.

The Committee on the Grading of Nursing Schools is, from a purely logical standpoint, the natural next step in such a program of advancement. Historically, however, its origin was a wholly different one and it is constituted in a very different fashion from the Committee on Nursing Education and is bound by none of the implications of the work of the earlier body. The present study was organized as a result of the appointment by the American Medical Association of a committee to confer with representatives of the League of Nursing Education, which had long been working on the problem, and to devise a combined method of attack. After preliminary conference, the Committee on the Grading of Nursing Schools was organized as a formal body, primarily made up of official delegates from the 7 national organizations interested in the problem as follows:

The National League of Nursing Education, Elizabeth C. Burgess, R. N., and Laura R. Logan, R. N.

The American Nurses Association, Helen Wood, R. N., and Susan Francis, R. N.

The National Organization for Public Health Nursing, Katharine Tucker, R. N., and Gertrude E. Hodgman, R. N.

The American Medical Association, William Darrach, M. D., with Winford H. Smith, M. D., as alternate.

The American College of Surgeons, M. T. MacEachern, M. D., with Allan Craig, M. D., as alternate.

The American Hospital Association, Joseph B. Haviland, M. D., with William H. Walsh, M. D., as alternate.

The American Public Health Association, C.-E. A. Winslow, Dr. P. H., with Lee K. Frankel, Ph.D., as alternate.

In addition, 6 members at large have been added to the committee, Mrs. Chester C. Bolton, representing the viewpoint of the patient and the hospital trustee; S. P. Capen, W. W. Charters, E. A. Fitzpatrick,

M. D., and Henry Suzzallo, representing the viewpoint of the educator; and Nathan B. VanEtten, M. D., representing the viewpoint of the medical practitioner. The committee was extraordinarily fortunate in persuading William Darrach, M. D., Dean of the College of Physicians and Surgeons of Columbia and the A. M. A. representative on the committee, to serve as its chairman, and Dr. Darrach has thrown himself into the direction of the work of the committee with a vision and an enthusiasm which go far to insure the success of its work. Dr. May Ayres Burgess, a statistician and investigator of unusual experience, was appointed Director, and on her recommendation the committee adopted, November 18, 1926, a 5-year program for the studies which it contemplates. It was felt that these studies must cover a much wider field than that included within the four walls of the training school itself. If the grading of an educational institution is to be worth while, it must be based on very serious consideration of the purposes which such an institution should subserve. In our specific instance, any attempt at educational improvement must take into account the community need for nursing service in respect to quantity, quality and cost; for it is the real needs of the community that must ultimately govern the educational policies to be pursued.

THREE MAJOR PROJECTS

We have therefore included in our program three major projects or studies concerned respectively with:

- Supply and demand for nursing service
- Job analysis of nursing and nurse teaching
- Actual grading of nursing schools

In other words, we want to find out first how many and what kind of nurses are now available, and at what cost, and how many and what kind of nurses should be available in order to meet vital community needs; and what kind of training these nurses should have and how that training should be given. These are large questions and we do not expect to answer any of them with finality. We do hope, however, to obtain a sufficient basis of information along these two lines to make an intelligent approach to the final problem of grading a reasonable possibility.

We plan to distribute the work on these projects in overlapping fashion over the 5-year period, completing the major part of the supply and demand study during the first 2 years, concentrating chiefly on job analysis during the second and fourth years and making progress on the grading plan each year, with special concentration upon it during the fifth year.

We estimate the cost of the supply and demand study at \$42,000,

the job analysis at \$72,000 and the work on the grading plan at \$86,000, a total of \$200,000 for the entire 5-year program. A considerable part of this budget is assured by annual contributions from the 7 parent organizations and the rest will, we feel sure, be contributed by foundations and individuals now having the matter under consideration.

SUPPLY AND DEMAND

The study of supply and demand, was the first objective to be actively attacked and during the first year of the committee's life it has been pushed forward with substantial results. We desired to find out what shortage of nursing service, if any, existed and under what conditions it manifested itself and what particular kinds and qualities of nursing service were concerned. On the one hand, it is a matter of common experience that many physicians complain of inability to obtain the type of nursing service which they need and that the public groans audibly over the cost of the nursing service which it obtains. On the other hand, Janet M. Geister, R. N., pointed out two years ago at the American Health Congress at Atlantic City* that the private duty nurse has her just ground for complaints in regard to unreasonably long hours, inadequate income and irregularity of employment. What are the facts and what is the remedy for a situation, which at times seems to be equally unsatisfactory to all parties concerned?

In order to throw some light upon these questions we attempted a very extensive study by means of questionnaires, addressed to the various parties at interest in the case, in 10 states, selected as reasonably typical of conditions in various geographical sections of the United States. The states finally chosen were California, Georgia, Illinois, Kansas, Louisiana, Massachusetts, New York, Pennsylvania, Washington and Wyoming and in these states we canvassed 5 different classes of persons: the nurses themselves, the physicians, the hospital administrators and the health officers who employ them, and a selected group of the patients who had recently received the ministrations of a nurse in hospital or home. The response to this questionnaire has been extraordinarily encouraging. Thus we have received 30,000 returns from private duty, public health and institutional nurses, with 1,456 returns from physicians and 1,209 from patients; and the results are of substantial interest and significance.

First of all, we have no evidence of a general gross shortage of nurses in any of the regions studied. On the contrary, the testimony of the physicians is almost unanimous that the general supply is ample. There

* Geister, Janet M. Hearsay and Facts in Private Duty. *Am. J. Nurs.*, 26, 7:515 (July), 1926. (Delivered before the American Nurses' Association at the American Health Congress, Atlantic City, N. J., May 18, 1926.)

is a very real and a very serious shortage of specially qualified nurses, of nurses able to do public health work, of nurses able to care for mental cases, or children's diseases; but this is a problem of quality not quantity. There is a real and severe shortage of nurses of any kind at certain times and in certain places, on Sundays and holidays and in rural districts; but this is a problem of organization. There is often a shortage of nurses to care for disagreeable and dangerous cases, individual nurses refusing to care for pneumonia or acute contagious disease or genitourinary conditions; but this too is a problem to be solved only by the development of some type of formal or informal group responsibility. That there is no fundamental and general shortage, is made clear by the fact that our average private duty nurse, during the month of March when the demand for nurses is at its annual peak, spent one day out of seven in waiting for a call.

Nor does it appear that the physicians canvassed have any fundamental criticism to make of the general quality of the nursing service which their patients actually receive. We asked each medical recipient of our questionnaire to describe one typical case in which he had a nurse working under him during the last week in March and whether he would like to have the same nurse again on a similar case. Eighty-seven per cent of the physicians answered "yes." In response to a question as to the necessity of certain special qualifications on the part of the nurse in the typical case cited, the physicians made the following highly significant response.

PHYSICIANS' REPLIES REGARDING SPECIAL QUALIFICATIONS	
Quality or Type of Service	Percentage of cases in which quality was needed
Skill in giving general care and making patient comfortable	63
Skill in observing and reporting symptoms	44
Care in following medical orders	40
Good breeding and attractive personality	34
Skill in handling people	30
Familiarity with hospital routine	28
Skill in asepsis	26
Experience and background	24
Skill in giving special treatments	21
Familiarity with physician's personal methods	20
Familiarity with particular disease	16
Ability to work under heavy strain	13
Responsible adult to take charge of family	3
Mother's helper and house worker	2

Certainly, the first three and the fifth qualifications would seem to indicate the need for a fairly high type of education, in preparation for a profession in which they are to be displayed.

In general, then, I may summarize the picture presented by the reports of physicians and patients somewhat as follows—but please re-

member that in this and all other summaries and conclusions I speak only for myself as an individual, not for Dr. Darrach or Mrs. Burgess or for the committee as a whole. The conclusion would seem justified that there are enough nurses and perhaps too many nurses in the country as a whole (as evidenced by a day a week of enforced idleness even in the month of March); but that nurses are hard to obtain in rural districts and on holidays, that they are often loath to undertake dangerous and difficult cases, and that they are often not qualified for the higher types of nursing service desired. Furthermore, the cost of private duty nursing service ranging from \$35 to \$112, depending on type of illness and location, is unquestionably a very severe burden on the average family.

Next, what has the nurse to say about the problem? Here, our questionnaires give us a very clear answer, but one whose tenor differs markedly according to the particular type of nursing service with which we deal. It is estimated that there are some 110,000 private duty nurses in the United States, 12,000 public health nurses, and 30,000 institutional nurses. The representatives of the first of these groups responding to our questionnaire give us on the whole a rather dismal picture of this sector of the field. They find the burden of 24-hour duty (prevailing in 56 per cent of our cases) unbearably heavy, an undue tax on their physical strength, and an almost insuperable bar to normal human relationships. During one week in March the average private duty nurse lost 0.35 days on account of illness, the public health nurse 0.13 days, the institutional nurse 0.09 days. The general distribution of time for the week is indicated:

TABLE I
DISTRIBUTION OF TIME LAST WEEK OF MARCH

	Private Duty Nurse Days	Public Health Nurse Days	Institutional Nurse Days
Work	5.1	5.7	5.9
Rest	0.5	1.2	1.0
Waiting	1.0		
Illness	0.4	0.1	0.1
Total	7.0	7.0	7.0

In Dr. Burgess's words, the private duty nurse worked less and rested less; but worried more and was sick more.

The second point, also brought out by Table I is irregularity of employment; and it is this irregularity of employment which in large part accounts for the fact that while private duty nursing is costly for the patient it is also unremunerative for the nurse. The main facts in this regard are brought out in Table II.

The private duty nurses begin work at about \$1300 a year and with

TABLE II
ECONOMIC STATUS

	Private Duty Nurse	Public Health Nurse	Institutional Nurse ¹
Average annual income	1311	1720	2079
Per cent reporting savings of over \$1000	28	32	45
Per cent having had to borrow money during past year	14	8	3

1. \$500 a year estimated as value of maintenance

occasional variation between \$1300 and \$1500 keep at about the same level throughout their working lives. The public health nurses start at about \$1450 and rise to a maximum of \$2300 after 25 to 30 years of service. The institutional nurses start at \$1700 and rise to a maximum of \$2500 after 15 years of service.

The private duty nurse on the whole is either overworked or idle; with the net result that her income and her savings are small and her debts large; and, what is perhaps most serious of all, she has no future, nothing to look forward to, for her income and her general status are worse rather than better after 25 years of service than in the year after her graduation. It is no wonder then that but 55 per cent of the private duty nurses canvassed announced their intention of continuing in the work, against 86 per cent of public health nurses and 82 per cent of institutional nurses. You see that your kind of nursing—our kind of nursing if you will let me call it such—is somewhat less profitable financially than institutional nursing but yet seems to yield an even higher satisfaction.

Here, are the sorts of things the public health nurses report on the back of their questionnaires:

I am doing school nursing and am very happy in it. It exceeds by far any other kind of nursing I have done. There is time enough outside of my work so that I can have other interests, and in that way life does not become monotonous and I can have friends which I found impossible to do when I was doing private nursing. My health is very much better as my hours are regular. I can get the proper amount of sleep uninterrupted and I am out of doors part of the time since I make home calls. My daily associates are very agreeable since I come in contact with teachers who serve as mental stimulus. In general, life seems very much worth living.

In my position as county tuberculosis nurse which includes school nursing I guess I feel the thrill of covering the whole county and sort of mothering the whole county, whereas before my efforts were usually confined to one patient at a time. The interest in public health nursing is so far-reaching, and has so many angles that it surely holds your interest and never lets that interest wane.

Public Health Nursing will be my life work; only I hope to be able to take the course at the university and be more competent. I like it better than anything I have ever done. I have been in my present position ten years. You can do more for humanity in it than in anything else in the world.

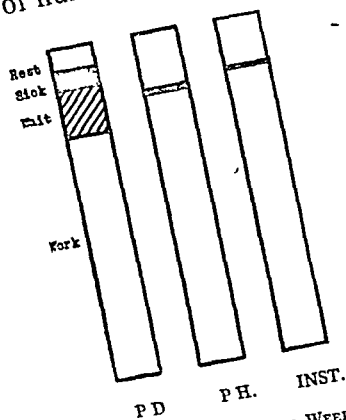
This is all very gratifying to us as public health workers but the status of private duty nursing is gravely disquieting. What is the answer to the problem?

Clearly, it is not a mere increase in the number of women practicing a profession under conditions so unsatisfactory that barely half of those now in the field desire to continue in it. Equally clearly, as it seems to me, the solution must be found in better organization of the nursing service now at our disposal. Is it not obvious that the whole system of 24-hour nursing in the home by nurses working on a purely individualistic basis is bound to be costly to the patient and arduous and unrewarding to the nurse? Is it not obvious that better organization of the care of the sick will remove some of the objectionable features of the present plan by placing a certain proportion of the acutely ill, now cared for at home, in hospitals under group nursing care, and by handling another fraction through a considerable extension of the principle of hourly nursing? Is it not obvious that better organization of private duty nurses themselves will obviate most of the other difficulties, by distributing the total volume of nursing service as between city and country, by coördinated effort to cover holiday service, by intelligent selection of the type of nurse to fit the special case, by the cultivation of an *esprit de corps* that will prevent the scandal of refusal to take the responsibility for a difficult or a dangerous case?

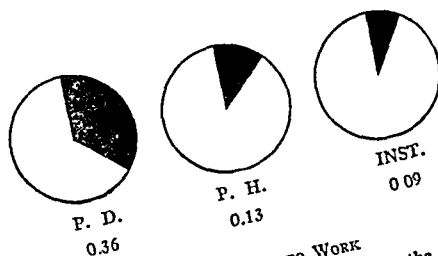
I think the answer to these questions must be in the affirmative. When we come to the question how such organization can be effected there will be less unanimity. Shall it be accomplished by using the existing public health nursing organization in each community as a nucleus, or by the expansion of the functions of the Central Registry, or by the creation of a new coöperative organization of the private duty nurses themselves? Speaking for myself and not for the committee, I believe that the public health nursing organization is the agent for this work, and that if the public health nursing organizations do not rise to the opportunity, the whole cause will suffer immeasurably. If the organization of private duty nursing is to be effective, it must be carried out first of all with the interest of the public as a whole primarily in view; and secondly, it must be carried out with reference to the highest standards of professional performance. The public health nursing organizations are "public service corporations" in the highest sense of the term and they are the only organizations which have the supervisory force to make a community nursing service work, and work with success.

If the registries were to undertake the task they would be forced to build up a duplicate supervising staff, which would be wasteful and

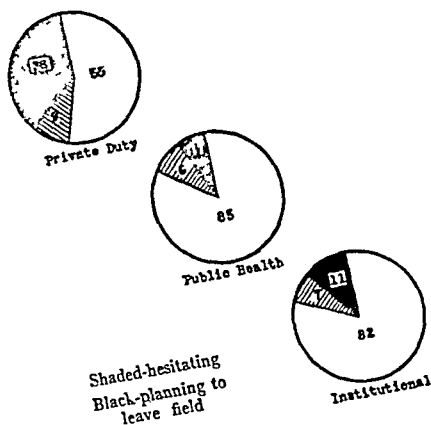
almost impossible in view of the limited supply of qualified persons; and if by any miracle they succeeded the result would be to create parallel community nursing services, one for the rich and one for the poor, an outcome which would set our whole movement back ten years or more. What I hope may happen is that by the development of hourly nursing through the regular visiting nurse staff, by coöperation with the registry, and perhaps by the organization of a sort-of reserve corps of nurses available for 8 or 12 or 24-hour service—whether on a



THE TYPICAL MARCH WEEK
Private duty nurses worked less, worried more, were sick more, and rested less than the nurses in the other two groups

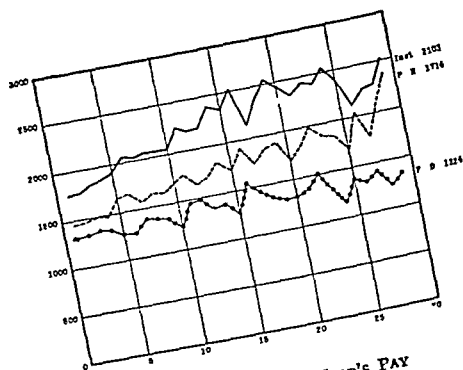


DAYS TOO SICK TO WORK
Each circle represents a day. During the week studied the typical private duty nurse lost 0.36 of a day because of sickness; the public health nurse lost 0.13 of a day; and the institutional nurse 0.09.



KEEP ON?

"Do you intend to continue indefinitely in this type of work?" Of the private duty nurses 55% plan to stay and 45% are either hesitating or definitely planning to leave the field. Among public health nurses the corresponding figures are 85% and 15% and among institutional nurses 82% and 18%.



YEARS OUT AND YEAR'S PAY

Average salaries received by private duty, public health, and institutional nurses who have been out from training school each number of years. (Institutional salaries include a flat allowance of \$500 a year for maintenance.)

salary basis or not I do not know, but all under sufficient supervision to guarantee adequate standards of service—by some such means as this, I hope to see nursing service in the homes of rich and poor, whether on a visit, an hourly, or on a daily basis, developed into one coördinated scheme of effective community service.

It is no easy task—perhaps it is an impossible task! I cannot but feel, however, that the problem is more likely to be solved by the visiting nurse associations with their prestige and with their command of so much of the best organizing ability of nurses and of lay directors than by any new organizations which might conceivably be developed for the purpose. It is because this problem presents so direct a challenge to many of the members of this section that I have dealt with it in so much detail.

JOB ANALYSES OF NURSING AND NURSE TEACHING

I must refer very briefly to the other two projects of the Grading Committee which as yet lie in the future. If the supply and demand study should indicate, as I suspect it may, that the community can get along with less rather than more nurses if their service is properly organized, but that a higher, rather than a lower, type of education is needed for the fulfillment of the demands of an adequate community program, we must next proceed to find out, so far as we can, what knowledge, training, capacities and qualities the nurse must have for success and how, and how far, these can be developed by education.

The method for doing this is what is known as job analysis! This means that we discover what a nurse should be like by studying her in action and seeing what she has to do. We list what she does, discover what problems she faces, and learn what she needs to know in order to meet them. When a careful analysis has been made of what the nurse needs to know and be, we then proceed to the second, and far more difficult process of analyzing the elements in the job of teaching her so that she will have these qualities.

This alluring, but very subtle and complex, task will be the major task of the committee during 1929 and 1930.

GRADING OF NURSING SCHOOLS

Meanwhile, however, the actual grading program will be worked out in parallel with the two study projects already discussed; and it is our plan to approach it along the following lines. To grade the 2300 training schools of the country on the basis of inspections would be enormously expensive and to grade them on the basis of the expert judgment of an inspector would require an inspectorate of an impossibly high caliber and would in any case provoke the defense reactions inevitably aroused by subjective criticism. The only solution would appear to lie in the use of relatively simple schedules of objective facts,

somewhat like the *Appraisal Form* of our Committee on Administrative Practice. Our task is to prepare a schedule which can be filled out at each school, by the authorities of the school itself, preferably with the aid of a representative of the committee, to serve not at all as an inspector but merely as an agent to explain the schedule and to secure uniformity in the interpretation of its items.

We hope to secure data on such a schedule for each of the 5 years covered in our study, beginning for 1927 with a few very simple and easily attainable items and including each year more items, and items less likely to be found in the machinery of the less developed schools.

So much for our method of obtaining the fundamental data upon which the standing of the schools will be ultimately based. How shall we set the standards to be met and how shall we grade the schools on the basis of the information thus obtained?

We shall not set any standards at all and we shall not grade the schools. We shall let them automatically set their own standards and automatically grade themselves. We shall, at the outset at least, publish no data for individual schools. We shall publish the distribution of schools by states in respect to each item studied and we shall inform each school where it stands on each item with respect to its fellows. Later on, as the schools begin to show improvement, it is possible that the names of those schools ranking in the highest third, or above some other determined level, may be announced. In any case, however, the standard of attainment will be set, not by the committee, but by the actual performance of the group as a whole. It will be a self standardization of the schools, by the schools, with the committee serving as a medium of intercommunication.

We believe that this plan will obviate any injustice to the weaker schools and will at the same time, through the force of emulation, produce a stimulus to improvement of almost incalculable force; and there is the added advantage that as the work of the schools improves standards will automatically rise. The program is on exactly the same general basis as the appraisal of community health service by the Committee on Administrative Practice which has notably succeeded in a constructive stimulation toward improvement without discouraging the more laggard and without checking the progress of the more advanced by standards which are fixed and arbitrary. We believe that this task, so performed, will offer the most powerful practical stimulus to the improvement of nursing education and will thus vitally serve the general cause of public health. We trust that the American Public Health Association may continue to support the work of the Committee on the Grading of Nursing Schools with this end in view.

Health Policies for Control of Public Water Supplies*

IN ITS REPORT for 1927 our committee has tried earnestly to comply with the instruction of the Committee on Committees to avoid overlapping the work of other committees interested in a similar topic. We are in thorough accord with the policy and hope future committees may, even voluntarily, be guided by it. However, it must be admitted that the specification adds to the difficulty of preparation of a report. Offsetting this, we are particularly favored in having Secretary A. E. Gorman suggest the title and treatment of the report we are about to make.

At the outset let it be said the report is less technical than in former years and is not so embracive as its title might imply. It contains but brief reference to lines of policy or attitude toward a few of the problems appearing on the horizon for health officers or departments supervising water supplies.

First let us return to an old theme—the establishment of team-work between the health department and the water department. Water works employees need and want help and encouragement. It is unbecoming that the health officer should resort to high-handed supervision. Furthermore the courts in recent years have relieved health departments of much of the need of police regulation of water supplies through the frequency with which they have assessed damages against negligent water works. The health officer's task is made more pleasant and fruitful if he will simply capitalize the eagerness of the water department to do the right thing. With a united front both the health department and water department will get better consideration from their superior officers. Divided, they furnish ammunition for the politician.

SIMPLE CONTROL TESTS

The water department, like any other, is much benefitted by having a yard-stick with which to measure the results of its effort to produce a safe supply. Since chlorination is now so common a safeguard against contamination, the free chlorine test is especially valuable. With a few exceptions the test is simple, and with care to apply the test

* Report of the Committee on Water Supplies, presented to the Public Health Engineering Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 20, 1927.

to reasonably clear water, its results are exceedingly reliable. The test ought to be almost universal where water is chlorinated.

Next in order of practicability is the test for *B. coli*. If the water department can support a proper laboratory it should carry on its own *B. coli* control with only an infrequent check by the health department or state laboratory. If the water department cannot support such a laboratory the health department may have to handle the test as a routine matter, and if possible also the sampling. The better the grade of sampling the more constructive the test becomes, because the sampler can then correlate the operating conditions against laboratory results. Too often health departments leave sampling to mere errand boys.

Whoever makes the tests should be sure of the technic used and know how to interpret the results. The present *B. coli* standard is admittedly a very strict standard, but it is doing excellent work in making water departments more particular. In many parts of the country, however, where soil wash is a factor, *B. aerogenes* may completely confuse the interpretation. Some years ago anaerobic and aerobic spore formers also led to incomprehensible results. There is still much obscurity in the meaning of the appearance of *B. coli* in tap samples, the freshly treated water evidently being always safe.

The point in noting these exceptions is that water bacteriology is not on a plane where one can accept its findings with too much positiveness, especially if indicative of contamination. The water department may easily lose confidence in the health department if the results manifestly disagree with what common sense or experience would tell. An unfavorable result should therefore be the occasion for an open-minded, judicious inquiry as to what caused the apparent contamination. First feel sure of the laboratory end of the work and the sampling. Then, with the water department, try to run down the explanation. Unfavorable tests are most valuable when they lead to betterment in plant or operation.

OPERATING RECORDS

This leads us to remark on the value of keeping good operating records and we bespeak coöperation between the two departments in devising as simple a report system as the circumstances admit. It is easy to wander into framing complex record forms which so provoke the practical operator that they are not kept well or kept at all. It takes coöperation and familiarity with operating conditions to devise a usable, simple record sheet which tells just the essentials. The minimum record is one showing that chlorination doses have been reasonably uniform and results consistent. At the other extreme is a form

showing also the various factors influencing chlorine demand and condition of the chlorinator as well. But the record must be a truthful story of what actually happened, as far as is known.

Health departments should require the submission of summaries of the report at intervals to be determined by the weaknesses in the system. Except in emergency, a daily report to the health department is not warranted, and in fact defeats its purpose, which is to give the health department a bird's-eye view of plant functioning and an opportunity to scan for dangerous tendencies in operation. The water department is interested in the detailed results. The health department looks for evidence of glaring or suspicious faults in operation. Erratic operation is always suspicious, but so also is operation which is too even to be truthful.

SANITARY SURVEYS

Regardless of the kind of water works, every health department ought to become thoroughly familiar with the sanitary environment, safeguards and weaknesses of each supply under its supervision. The survey is indispensable as a means of gaining first acquaintance, and if thorough it will detect the hidden opportunities for future trouble. Moreover, the survey needs to be repeated from time to time—like the annual health examination which the modern physician is constantly holding up to us. This cannot be any superficial investigation. It must be thorough. Even then a condition may slip by unnoticed and lead to catastrophe later. Here is no place to elaborate on what a sanitary survey would constitute. It is too broad a subject for general discussion. If there is no one locally trained in sanitation of water supplies, the state sanitary engineer should be invited to undertake the job or suggest a procedure.

WATER CHLORINATION

Chlorination, even as now practiced, can take credit for a large part of the striking reduction in typhoid throughout the country. Yet its introduction has been notoriously not along conservative lines. The set-up is seldom in duplicate or calculated to guarantee continuity of service. We suspect that even now if faulty water chlorination were as strikingly shown as an interruption in power supply when the lights all go out, some startling evidence would appear. In its field, chlorination is quite as unique as power in the dependence placed upon it. Is it not singular that in the remainder of the water and power systems of the country you will find duplicate pumps, boilers, electric supply lines and duplicate service pipes; yet seldom indeed do you find a duplicate chlorination set-up? Sometimes duplicate parts for chlorinators are on hand, but there must be an interruption in chlorination while the sub-

stitution is being made. Now the additional precautions for continuous safety are simple and relatively inexpensive.

Many water works are not protected against the infrequent emergency. It is true of water works in general and of chlorination in particular, that the precautions depended upon must not merely take care of average conditions but be adequate to meet the severe emergency which might occur perhaps only once in five or ten years. Chlorination as it stands today is, in most cases, under just a mediocre control.

These considerations prompt the committee to report rather fully the exemplary precautions in chlorination taken by the City of Chicago under the direction of A. E. Gorman. No doubt there are other notable chlorine installations, but this one will serve to illustrate the care involved in good chlorination.

The set-ups at Chicago are predicted on the principle that every drop of water sent to the consumers needs adequate chlorination. The result of following the principle in that city has been one of the lowest typhoid records of any city in the country, where formerly outbreaks appeared every few years. The cost to consumers for this chlorination is triflingly low—a little over 5 cents per person per year.

Factors influencing chlorine demand, such as algae, pollution, temperature, pumpage, etc., were first evaluated and a chlorine set-up adequate to feed 6.5 lbs. per m.g. at maximum pumping period decided upon. A complete unit is installed in one booth, which is protected against temperature variations, and this is all duplicated in another booth. Leaks in one booth therefore do not hamper use of the other. Booths have vent systems, and gas masks kept ready for use are nearby in a special locker. Tank batteries are made up and set on scales in the booth. The number of cylinders is determined by the rule that the feed must not exceed 40 lbs. per tank per day. To guard against empty tanks it is not attempted in Chicago to use all the chlorine. The tare weight is known and the cylinders are replaced while there is still a pound or so of chlorine left in the cylinder. Batteries are so drawn upon that no two can run out within 6 hours of each other. In Baltimore the cylinders in any one battery all set on separate scales and cylinders are so put in service as to avoid all running empty at the same time.

Scales for weighing the chlorine are set flush with the floor to avoid damage due to impact. Scales are periodically tested for their accuracy.

Duplicate header systems run from both booths and connect to each battery and each chlorinator, all properly valved for control. Likewise the chlorine feed lines are in duplicate and points of feed are chosen so that the effect of a change in dose can be immediately felt. Water flow

rates are known at all times. The type of machines used prevents stoppages in feed lines and diffusers in cold weather and cold water.

Lines from the scales to the header are so arranged as to avoid transferring coil pressures to the scales, which would make weights incorrect. Machines are overhauled when a battery is out of service.

Chlorine attendants are on hand constantly. These men have been schooled in the machines and in chlorine tests. They keep the installation in good working order, test the treated water for residual chlorine every hour or more often in emergency, and attempt to keep the residual chlorine at 1 lb. per m.g. as it leaves the plant. They also keep records of operation.

The health department of the city performs the bacteriological work on samples it collects daily from the raw water, from each plant, and from several points in the distribution system.

Control of chlorination to guard against overdose, underdose, and tastes, is difficult when the set-up is at the head of a distribution system, as at Chicago, and subject to the effects of water draft and a fluctuating demand. The new installations will be automatic, the chlorinators being actuated by the water flows, thus getting away from at least that important variable. In systems where balancing reservoirs are used, and there are a few feet of head available, it is possible to precede the balancing reservoir with another just adequate to take the daily fluctuation, the inflow being constant for a day. In this case chlorine is applied to the constant inflow.

The committee is not prepared to advocate the chlorination of all water supplies, but it does favor a thorough job of chlorination where that method is indicated.

There is a growing number of supplies where the pollution load is heavy for so frail a precaution as is chlorination in practice. Such supplies, as a rule, suffer also in physical impairments. Health officers may well support the water department in agitation for water filtration in such places.

WATERSHED SANITATION

In watershed sanitation it appears to us that there is special need for health departments to have a more settled attitude, especially in control of recreation. In parts of the country supervision is woefully inadequate, left in the main to an innate sense of decency of recreationists themselves. In other states, as in New Jersey, regulation has swung too far against public opinion. At the instigation of a number of cities, regulations were adopted by the New Jersey State Board of Health at the close of 1926 forbidding bathing or the maintenance of bath houses and places of entertainment which would pollute water supplies. A

few months later the representatives of pleasure resorts, recreationists and land owners succeeded in having put into law, over the governor's veto, a bill which legalizes bathing in the waters of that state.

The pendulum must soon swing to a position more compatible with the various opposing uses of the watersheds. With typhoid disappearing and community water supplies coming more and more under treatment, the course health officers will take is apt to be decided on the score of decency more than anything else, considering all parties concerned in a clean watershed, and realizing that there is always reaction against restrictions in which the public does not have full credence.

It was not long ago that there was considerable resort to universal ownership of catchment areas. The doctrine of course is opposed to other uses of the watershed and its effect is to limit or totally deprive the commonwealth of pleasures or prosperity that may come from the widest harmonious use of the country's assets, of which the watersheds and streams required to supply water to our growing metropolitan areas represent a large item. The principle of watershed ownership has about reached the limit of its economic usefulness. It is tantamount to hoarding and opposed to greatest beneficial use.

In our opinion, health officers and departments must not take an extravagant position. They must look at the problem in a broad light, yet build up sentiment for decency and against abuse. They can easily appeal to the sense of cleanliness and fair play in a man and hence to his own self-interest. They need not let down the bars nor forego their police power, but when a broad viewpoint permeates the watershed policy the courts and the public are apt to support the health office in curbing unreasonable use more regularly than appears now to be the case.

Use of streams for sewage disposal, with more or less treatment of the sewage, has come to be an accepted, legitimate one. Water consumers have adjusted their works and their ideas to it. To the widespread recreational use of the watershed and streams, however, there is not yet the same adjustment or a settled policy. Sewage in recreational streams of course is inadmissible. For one thing it generally ruins the region itself for recreation. Swimming in streams appears now to be the most common sanitary problem and the hardest to tackle, being so generally indulged in and so slight in its sewage pollution. We suspect the real objection to it is principally a mental and esthetic one which, however, cannot be entirely overlooked.

Recreation of watersheds was one of the serious topics before the Conference of Sanitary Engineers in Chicago this year and subsequent committee reports may gradually crystalize a policy. The preliminary

discussions, however, served to show that regulation, if any, to work most fairly, must be local.

This much is certain, that water consumers cannot look to the recreationist or other users to guarantee the safety of the supply. The consumers themselves can easily make the supply safe and entirely potable. It is preposterous to deny mountain recreation to the multitudes that the consumers may be spared the inconvenience of water treatment. The health department will succeed well if it holds recreational abuse in bounds and preserves such a degree of cleanliness as the pleasurable uses themselves dictate.

Water departments have, in various parts of the country, adopted a more coöperative attitude toward permanent residents on watersheds in helping to maintain a high degree of sanitation, the department often furnishing plans, the material or even labor. It will be well to meet this new recreation problem in the same way. Without encouraging recreation unnecessarily, sanitary conveniences can be provided in whole or in part and appeals made which will promote a high standard. In some cases, in coöperating with owners of the land, fencing can be done and the public thus kept off.

CROSS-CONNECTIONS

As a closing topic for this report the committee directs attention to what it regards as a retardant in the program of cross-connection elimination due to rather dogmatic approach. A year or so ago water works men, underwriters, and state sanitary engineers took a definite and rather drastic stand against cross-connections. Many states have set out to eliminate them, even fixing time limits within which they must be out. It is not clear just what next move was contemplated in the event of non-compliance.

When the Health Department of Chicago first took up the cross-connection problem in 1924 and 1925, there was drawn up a drastic, prohibitory regulation. It has never been adopted. Instead, simply by inspections, more or less frequently repeated, most owners of the connections were finally made to see the possibility of harm as it actually existed in each case. The stand taken depended on how badly polluted was the secondary supply and the real extent of the menace to public health.

The regulating officer must not overlook the fact that he is dealing with lay people who have thought only of one side of cross-connections, namely, the advantage to themselves in having an augmented supply and reduced insurance rates. They may easily have overlooked the danger to health in perhaps a long experience of immunity from evil

results. If there is danger in the secondary supply, naturally the cross-connector would feel its force most. Therefore he should have the greater interest in the elimination of any real menace, if properly approached. The real reason for the existence of dual supplies is often an inadequate public one, and in such a case the main efforts should be directed at a better system.

In general, the attitude toward cross-connections is to eliminate them rather than to control them. Various states and municipalities, principally through their health departments, have adopted regulations patterned after resolutions of the American Water Works Association, Fire Protection Division and State Sanitary Engineers, prohibiting physical connection between potable public supplies and any other supply unless the secondary supply also be potable and under regular examination as to its quality. States that have given the subject a great deal of thought over many years are convinced that education and mere request for discontinuance of cross-connections are not enough and that specific, definite laws are needed, because even though the power implied in them may not be exercised frequently, the power is available to force action where lack of interest exists. The mere existence of penal provisions does not imply that everyone would resort to penalization initially, because most people can be dealt with through reason.

It is probably impossible for water departments and health departments to escape the burden of having to discover cross-connections with the distributing system, the same as they now must do in uncovering pollution acts at the very source of the supply; but with respect to parties who pollute the source of supply, misdemeanor laws, at least, are found on practically all statutes. It seems rather curious therefore that one cross-connecting to a public supply and polluting it—doubly a trespasser and a polluter—should be subject to no responsibility for the deaths or illness he causes, or to no penalties other than mere discontinuance of supply to him. So far as we know, no one has considered writing into the statutes, laws which would make it a misdemeanor to connect a private supply into a public one.

SUMMARY

By way of summary, a few of the points made in this report are:

1. Use coöperation and encouragement rather than the "big stick" in dealing with the water department.
2. See that a thorough sanitary survey is made to show how the system is operated, and ferret out all sanitary weaknesses which need watching. Repeat the survey every year or so.
3. If the supply is a chlorinated one, see that the free chlorine test at least is used. It will carry much assurance and stimulate the operator to improve his rec-

ord. Also see that the water department or the health department makes competent tests for *B. coli* and be sure of the interpretation of the results. Employ competent samplers who can correlate results against operation. Devise with the water department a good, simple record form. See that the health department gets summary reports of operation which will show dangerous tendencies and mismanagement.

4. Get away from being satisfied with mediocre results and control. Insist on a reliably safe water all the time. Guard against not only those conditions regularly bad but against hazards which occur once in several years. As for chlorination, when it is needed, insist on installations that practically guarantee the disinfection of every drop of water sent to consumers. For instance, require all installations to be in duplicate, together with interconnecting lines, and see that there is never an interruption in the proper chlorine feed.

5. What to do with recreation on watersheds is a most imminent problem. The most pressing phase is the swimming problem in water supply streams, entertainment on a large scale, and hunting and fishing. We cannot help moralizing on the happenings in New Jersey when the State Board of Health prohibited swimming and entertainment on water supplies, and the kick-back was that resort owners, real estate subdividers, and individual owners along the stream secured the passage of a law over the governor's veto that legalizes swimming and bathing in the waters of the state.

The problem is to keep down recreational abuse if only to perpetuate its enjoyment. Look on watersheds not as a single asset but as having multiple uses of value and try and harmonize all with the least inconvenience and restriction needed to preserve each one. The minimum need is for clean, decent uses of the watersheds. In recreational areas sewage pollution is dangerous and will wreck the region if not curbed. Swimming should be considered more for its uncleanly effects on the stream. As a source of dangerous pollution it is of little importance. We are equally certain that water departments can easily, and therefore must, take the balance of the burden of protecting their own supplies by adequate water purification. We also commend that they cooperate in maintaining sanitary conveniences and safeguards on watersheds from which they take their supplies.

6. The formula for dealing with cross-connections appears to lie in the adoption of local and state regulations prohibiting such cross-connections, intakes, bypasses and other dual supplies unless the same be of known potable quality. In the administration of such a prohibitory ordinance, the powers provided by such regulation are to be looked upon as a reserve measure when education fails, in particular instances. The formula must further provide for the detection of cross-connections. That is easier in a publicly-owned system than in a privately-owned one, because if the owner of the premises forbids, he can prevent the company employees from entering.

We would throw out the suggestion, further, that cross-connections and consequent pollution should be made a misdemeanor offense, the same as has long been the case with respect to acts of pollution on the watershed and other parts of the system.

C. G. GILLESPIE, *Chairman*

C. R. COX

GEO. G. EARL

W. O. HOAD

JOHN R. BAYLIS

Activities of Plankton in the Natural Purification of Polluted Water*

W. C. PURDY

U. S. Public Health Service, Cincinnati, O.

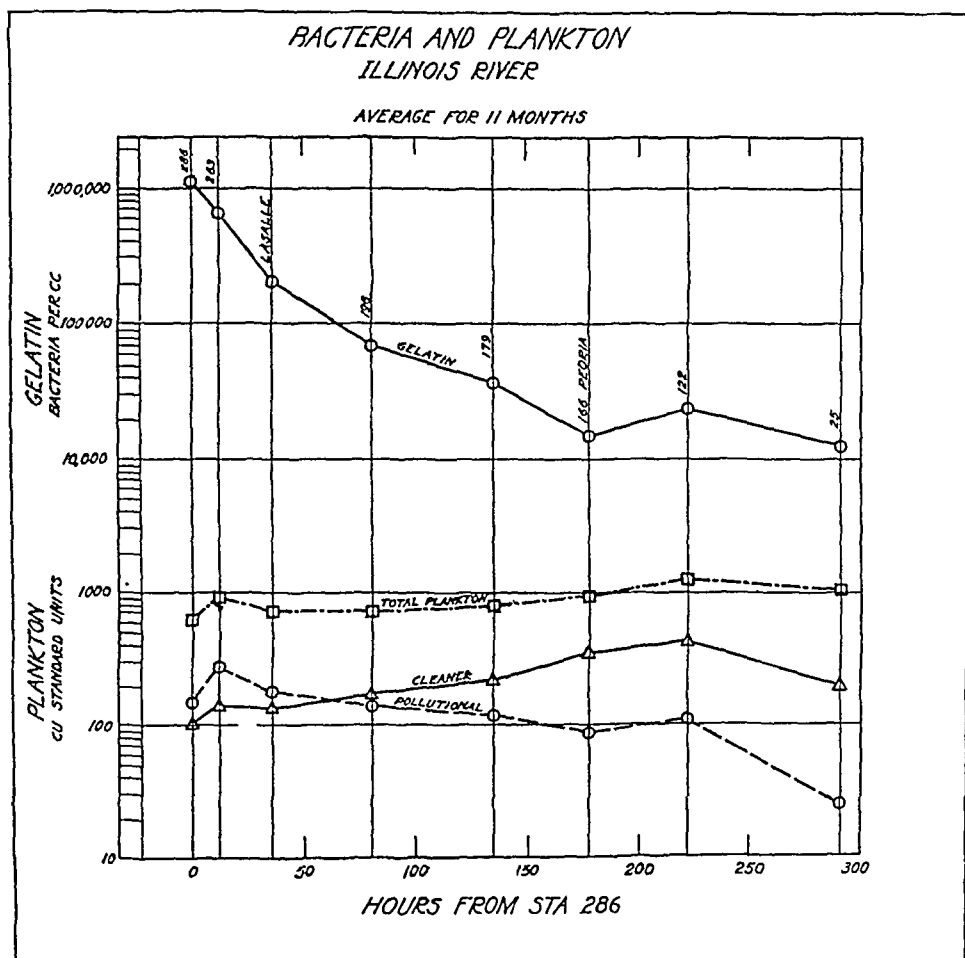
AS a rule, plankton and related organisms are most abundant in water which is in process of recovery from pollution by sewage, that is, during the period of natural purification. Hence we may inquire, (1) Are the activities of these organisms a part of the program of natural purification? (2) What effects, if any, are produced on the water by the presence and activities of these minute forms of life? and (3) What are some of the activities?

Biologically speaking, these microscopic organisms are low in the scale of life, have little differentiation, and relatively few activities, these being concerned chiefly with obtaining food and reproduction of species. From the standpoint of effect upon the water, the matter of food supply would seem to be dominant, and this may be discussed with advantage under the subheads—(1) plankton food, (2) photosynthesis, and (3) expenditure of plankton energy.

Some years ago a noted German investigator, Dr. Marsson, classified all plankton organisms as "food producers" and "food consumers," including in the latter class those organisms which by means of lash, cilia, or other appendage directed a current into their mouth-vacuole or gullet, thereby obtaining minute particles of food, including bacteria. Many other workers both here and abroad have observed and recorded the consistent tendency of certain plankton forms, conveniently designated "pollution organisms," to become numerous when sewage is present and bacterial content is high, and the subsequent decrease or disappearance of these same organisms when bacterial content becomes low. There is abundant presumptive evidence of this sort to the effect that certain plankton organisms necessarily find much of their food in bacteria, not only because of the simultaneous fluctuations of the numbers of the two classes of organisms, but also because of the observed methods of feeding, and the body structure of the plankton organisms as indicated by Dr. Marsson, above quoted. In fact, it would be diffi-

* Read before the Laboratory Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 21, 1927.

CHART I



cult, or impossible perhaps, for the feeding plankton organism to avoid ingesting large numbers of bacteria.

In three rivers thus far studied (Potomac, Ohio and Illinois), these pollutional organisms are most numerous in that part of the stream where pollution is physically evident, and decrease rapidly as the water regains normal condition. Chart I, showing decreasing bacterial content, and decreasing pollutional plankton meantime, is based on Illinois River data, and is, in general, representative of the other streams.

There is, however, quite satisfactory evidence, based on careful laboratory tests, that certain of these pollution organisms are able to consume very large numbers of bacteria, the plankton meantime increasing greatly in numbers. A brief report of these tests was published in 1918.¹ From that report we present herewith Chart IV, and one or two unpublished ones relative to the same tests.

CHART II

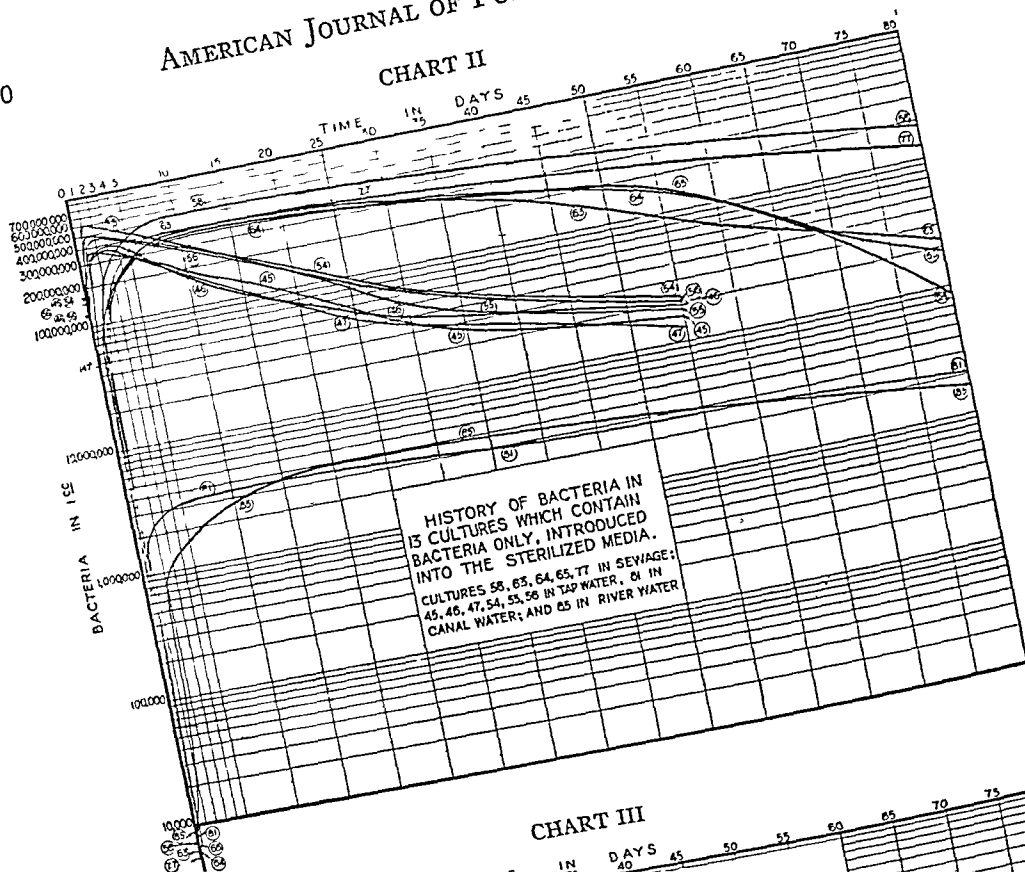
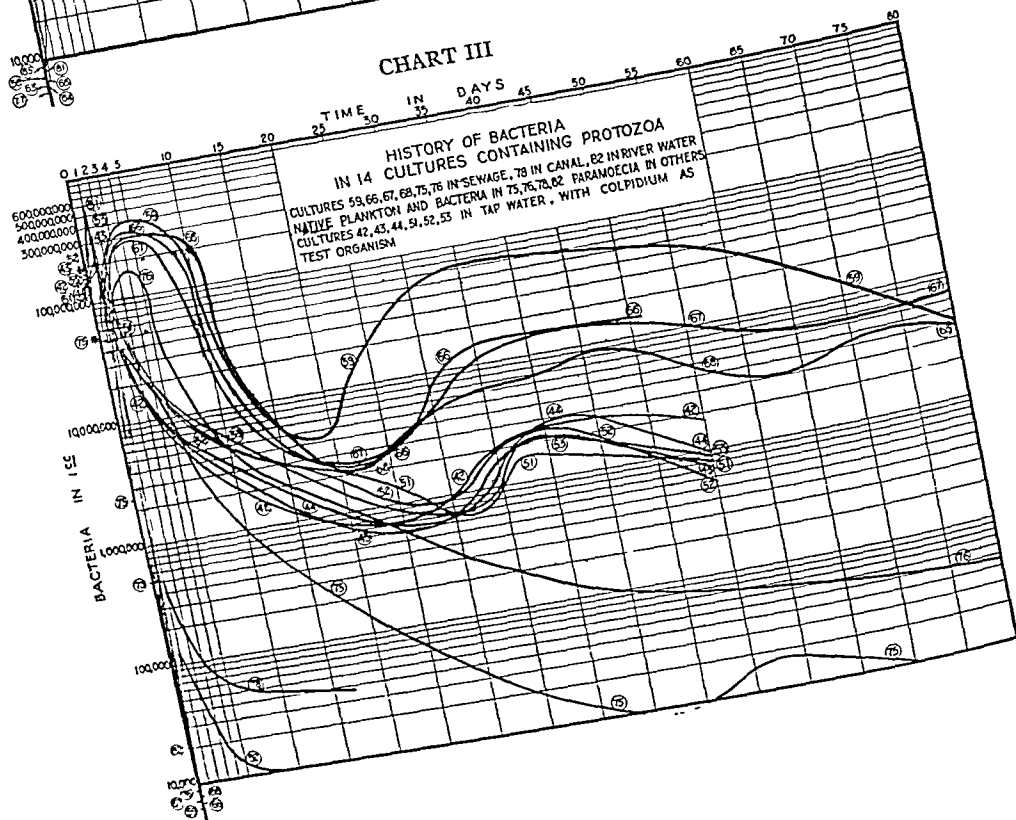


CHART III



Essential results of these tests were as follows,

1. Sterilized sewage, inoculated with bacteria only, reached a very high count in 4 to 6 days and maintained this for 6 to 10 weeks.
2. Sterilized sewage, inoculated with bacteria and also with pollutional protozoa, showed high bacterial maximum in 4 to 6 days, then shortly heavy and rapid reduction, with rapid increase in protozoa about the time of greatest bacterial decrease.

These experiments, repeated many times, always gave essentially the same results, as shown by Charts II and III.

All of the cultures shown in Chart II were of sterilized medium inoculated with bacteria only.

All of the cultures in Chart III were identical with those in Chart II, except for the presence of protozoa in the cultures. It will be noted that the bacterial history is very different. Comparison can best be made by inspection of Chart IV, here shown.

Culture 65 contains bacteria only. The very high content is maintained for about 60 days. Culture 68 is identical except that it contains protozoa, in addition to bacteria. It will be seen that, in this culture, the high bacterial content drops suddenly. It seems significant that the protozoa increase rapidly meantime.

One culture of sterilized sewage was inoculated with bacteria-free protozoa (paramecia). Apparently the minute organic detritus present, and the dissolved materials, did not constitute suitable food, for all the paramecia died within 4 days. After 14 days this same medium, still bacteria-free, was again inoculated with paramecia, but bacteria were added this time. The paramecia multiplied more than a hundredfold under these conditions.

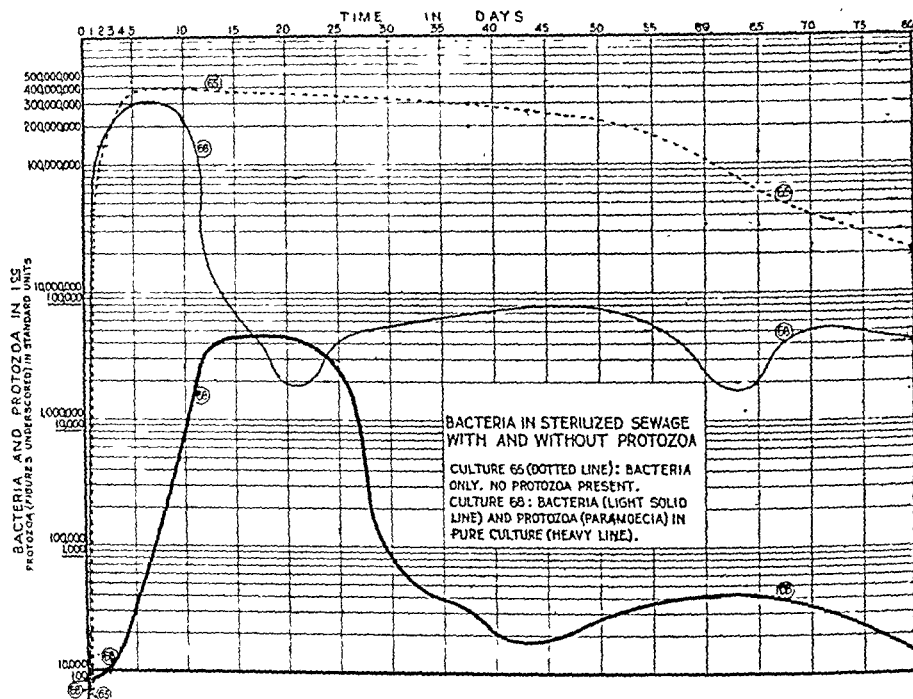
In view of all these results, as stated, it seems difficult to offer any satisfactory explanation other than that the paramecium, a typical pollution organism, consumed bacteria in large numbers. Apparent confirmation of this food habit is indicated by the speedy death of paramecia in the culture which contained no bacteria, and subsequently by the immediate increase of other paramecia in this identical flask of sterile sewage when bacteria were added.

Further laboratory tests indicate that colpidium, another typical pollution organism, is capable of living in a liquid medium (ordinary broth) without bacteria, but it failed to live in sterile sewage without bacteria added. Moreover, it will live in sterile water to which has been added a suspension of bacteria only. These facts indicate the probability that colpidium is in nature a consumer of bacteria, but that life is possible for it with a diet of dissolved organic matter alone, such as

REFERENCE

1. Purdy, W. C. and Butterfield, C. T. The Effect of Plankton upon Bacterial Death Rates, *A. J. P. H.*, VIII, 7:499 (July), 1918.

CHART IV



broth, provided this be of suitable strength. It has been suggested (by Mr. Butterfield, I believe) that the bacteria are merely the convenient agents to gather or harvest from the water and store within their bodies the highly-diluted soluble organic matter which, in the more concentrated form represented by the resulting bacterial bodies, is suitable food for colpidia and for other protozoa as well.

PHOTOSYNTHESIS

A second major activity of plankton relative to food habits should be mentioned. Reference is made to photosynthesis, by which the chlorophyll-bearing organisms of the plankton, mostly plants, dissociate carbon dioxide and water in the presence of sunlight, and in recombining the elements to form starch, the basis of their nutrition, the excess oxygen is given off as a waste product. Unless the water is already saturated, this oxygen will be dissolved to some extent and may be utilized, if needed, in the aerobic decomposition of organic matter.

Beyond the brief statement of this activity, we have as yet no experimental data to offer. We may state, however, that even in such a polluted stream as the Illinois River the major part of the plankton, volume for volume, is of the chlorophyll-bearing, oxygen-producing sort, and we venture the opinion that adequate study of this unique

activity of the plankton may result in a high rating as to its significance in the program of natural purification.

EXPENDITURE OF ENERGY

1. *Locomotion*—Under the microscope, the plankton activity that is most apparent is that of physical movement. Ciliates scurry to and fro apparently at breakneck speed. Flagellates glide slowly, pulled by their one or two rotating flagella extending a body-length ahead. Oxytricha and its kind move forward, suddenly go in reverse for half a body-length, change direction and again go forward, and so on indefinitely, pursuing a most erratic course. Rotifers start their "wheels" and are thereby pulled through the water as an airplane is pulled by its propeller. Nematodes produce a series of minute maelstroms by their violent contortions, and cyclops, speediest swimmer of the plankton, together with certain other crustacea, travel by a series of leaps or jumps that have given them their popular name of "water fleas."

While the apparent speed of these minute forms is great, the actual speed is very low. A colpidium will cover nearly 1 millimeter per second, a paramecium 3 millimeters, a rotifer 2. But consideration of the *relative* speed shows that the colpidium, 50 microns long, is traveling about 20 times its own length in 1 second, the paramecium 12 times its length, the rotifer 5 or 6 times. A cyclops, hurling its sturdy body through the water 70 or 80 millimeters per second and covering about 100 times its own length meantime, holds the palm. Such relative speeds are impossible for our best motor boats.

But water, being mobile and noncompressible, is locally disturbed and displaced by the movement of a submerged body. In the case of the plankton, the submerged body is self-propelled by its lashing the water with numerous minute cilia, like microscopic oars, or by the rotary movement of flagella, simulating propellers, or by the powerful strokes of paired lateral swimming organs. The disturbance of water thus produced extends far beyond the limits of the body causing the disturbance, as the oars and propeller of a boat produce currents and eddies a boat's length or more away. A paramecium will thus cause minute but violent agitation of the surrounding water to a distance of 100 microns or more on all sides. If 50 paramecia are present in 1 cubic centimeter of water, these will, in about two minutes, subject every particle of this water to this minute and intimate mixing. In like manner, 100 colpidia will, in 22 minutes, minutely mix every portion of 1 cubic centimeter of water. Polluted water usually contains various other motile forms also, some nearly or quite as large as paramecium, others exceedingly minute, but very numerous and usually very active.

2. *Movement of attached organisms*—There are also other organisms, not free-swimming, but attached to any convenient anchorage, at the water's surface, on the bottom, at the margins, or even on small masses of suspended matter. Such organisms, usually in groups or colonies, are mainly of the vorticella type. On the open end of their bell-shaped bodies are rows of cilia in practically constant motion, bringing to each organism a minute but continuous current of water. These colonial forms are amazingly abundant in a sewage polluted stream, forming a whitish feathery coating on bottom stones or trailing from any available submerged attachment. One cubic centimeter of this whitish growth may contain over 200,000 of these minute bell-shaped organisms, and every one of these is engaged in producing the continuous microscopic water current referred to.

The sum total of the minute mixing which these various plankton organisms impose upon the polluted water must be sufficiently great to merit consideration. It is frequently the case that there are present more than 50 paramecia and 100 colpidia per cubic centimeter. But if only these be present, their movements will cause minute, intimate mixing of 1 cubic centimeter of water in one and three-fourths minutes. This being the case, it is surely a conservative estimate to credit the total population of microscopic protozoa of polluted water with complete and intimate mixture of 1 cubic centimeter of water in 1 minute. The process might be conveniently and adequately indicated by the aphorism, "Minute mixing each minute."

Effects—What is the probable effect of such minute continuous mixing and microscopic circulation thus imposed on polluted water during the period of its greatest pollution? We can only say, in the absence of experimental data, which so far as we are aware have not yet been obtained or even attempted by any one, that human experience from time immemorial and in many lines attests the great value—the absolute necessity—of thorough and intimate mixing of ingredients if proper results are to be obtained within reasonable time. In more recent years, the activated sludge process has furnished a striking example of this. It therefore seems reasonable to suppose that this microscopic circulation and minute mixing caused by plankton movements during the critical initial stages of natural purification of polluted water may be a factor of importance in the successful and speedy progress of such purification. In our laboratory, cultures of sewage, containing bacteria only, retained their foul odor and their milky turbidity for 8 weeks or more, while like cultures, which however contained actively motile plankton organisms in addition to bacteria, lost their turbidity and their foul odor in about 10 days. It is possible that

the continuous movements of the plankton organisms were a factor in the latter case. More specifically, we may indicate one result which appears to come from this plankton activity.

These organisms find their food in the polluted water, for they live and multiply therein. As the water slowly regains normal condition apparently this food slowly disappears also, for the organisms lose their plumpness, become thin, then gradually disappear. Apparently the organic matter that constitutes the *pollution* of the water constitutes also, to a great extent, the direct or indirect food of certain plankton organisms that are then numerous. Thus a portion of this polluting organic matter of the water reappears as a multitude of minute living organisms whose rapid and continuous movements represent the *energy* of the organic food they have consumed. In other words, a portion of the harmful organic matter is consumed, then released to the water in terms of motion. Latent energy in harmful organic form has now become kinetic and harmless, and is made to do work concerned with the betterment of the water itself. Correlation of energy is effected, and the polluted water is started on the road to recovery.

3. *Movement of larger organisms*—Certain larger organisms attack masses of organic matter or work in the bottom sediments. *Cypris*, a plankton crustacean, works the surface of sediment over and over until this is reduced to a state of microscopic fineness. The naiid worm *Dero*, occasionally found in the plankton, is frequently very abundant in heavy surface films, where it attacks and burrows into masses of organic matter, apparently eating almost continuously, judging from the great frequency and relatively large amount of its fecal excretions meantime. *Limnodrilus*, an oligochaete worm which does not belong to the plankton proper, delves in rank bottom sediments and works these over, excavating beneath the mud surface and depositing this material on the sediment surface in the form of great numbers of fecal pellets dropped from the anal end waving to and fro meantime in the overlying water. Certain other organisms also help to reduce these larger masses of organic matter or of sediment, but the three just mentioned are outstanding in their activity.

SUMMARY

It is our opinion that the activities of plankton and related organisms constitute a part of the program of natural purification of polluted water, in that their food habits tend to remove a portion of the organic matter, the photosynthetic activities of chlorophyll-bearing organisms operate to produce oxygen, and the energy of harmful organic matter consumed as food and released to the water in terms of motion, serves to furnish an intimate mixing and microscopic circulation during the critical initial stages of recovery from pollution.

The Residual Germicidal Action of Water Treated with Ultra-Violet Light*

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Chicago, Ill.*

THE WORK of Steenbock¹ and his associates, of Hess² and his coworkers, and of others, has demonstrated that fats and oils and certain lipoidal substances can be activated for the prevention of rickets by exposure to ultra-violet light. If the light rays absorbed and then slowly emitted are responsible for this antirachitic activity, it is not unreasonable to expect that such irradiated materials might also exert a germicidal action. Such a possibility was suggested many years ago and denied by Cernovodeanu and Henri³ in 1910. The question was again raised in 1921 by Walker and Pryer.⁴ They concluded that water after exposure to an ultra-violet lamp retained some germicidal activity which was sufficient to destroy a certain percentage of added bacteria, and that this property was dependent upon the amount of electrical energy consumed by the ultra-violet lamp. I have been unable to find any further published material bearing on these claims, except a statement in an article by Coblenz⁵ to the effect that ultra-violet light of high intensities affected nutrient agar so as to cause a "considerable mortality" among *Bact. coli* with which the agar plate was inoculated.

In view of the fact that the claims made by Walker and Pryer have not been generally accepted in spite of the somewhat striking experimental data obtained by them, it seemed desirable to reinvestigate this supposed residual germicidal action and, if positive results were obtained, to study the factors involved, particularly in relation to the composition of the exposed water.

Our first experiments were made with Chicago tap water. This is a water of moderate mineral content and with relatively small contamination from sewage or trade wastes. Before entering the ultra-violet ray machine the water was passed through a bone black filter to remove any traces of chlorine. The samples used for our experiments were tested, as a matter of routine, for chlorine with ortho-tolidin. All tests

* Read before the Public Health Engineering Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 19, 1927.

were negative. Two commercial ultra-violet light sterilizers were used. One operated on a 110 volt electric circuit. The actual voltages across the lamp during operation varied from 70 to 75 volts. The current was maintained at 4 amperes. The energy consumed was between 280 and 300 watts. The capacity of the machine was about 350 gallons per hour. This same machine was also used with a lamp operated at 80, 90 and 120 volts and 5 amperes, giving wattages from 400 to 600. The other machine was operated on a 220 volt circuit and had a capacity of 1,500 gallons per hour. Our pressure was not sufficient to maintain such a rate of flow. The actual rates during operation varied between 300 and 360 gallons. This should be noted in connection with the interpretation of our results, since the time of exposure of the water to the lamp was much longer than that for which the sterilizer was designed. The voltage across the lamp during operation was 170 and the amperage varied between 4 and 4.5, giving wattages from 680 to 765. A few experiments were made with a lamp which was operated at 200 volts and from 4 to 8 amperes. The energy consumed varied in different experiments from 800 to 1600 watts.

Most of our experiments were made with a Rawlings strain of *Bact. typhosum*. Some tests were also made with a strain of *Staph. aureus* and a few with a culture of Friedländer's bacillus. The number of bacteria was determined by nutrient agar plate counts.

The method of procedure to study any possible residual germicidal action was as follows: The machine was started and allowed to operate for 2 to 4 hours before samples were collected. For each test two samples were taken—one immediately before the water entered the sterilizer and the other as the water left the machine. The samples were collected in sterile glass stoppered bottles. Both the control and test specimens were inoculated with organisms from a 24-hour broth culture after being centrifugated and washed three times with sterile saline. The numbers of organisms added per cc. of sample varied from 150 to 5,250. Agar plate counts were made immediately after inoculation and again after 30 minutes. In some cases counts were also made after 1 and 2 hours. Colonies were counted after 24 hours' incubation at 37°C.

Thirty experiments were made. Except in two instances there was a decrease in the colony count both in the control and sterilized specimens during the first half hour after inoculation. This decrease was not greater in the sterilized than in the control samples. Samples of each kept for 24 hours showed enormous increase in bacterial count.

Our conclusions are based on a comparison of the agar counts from the inoculated sterilized water with those from the inoculated untreated

LABORATORY

C. C. YOUNG

MODIFIED SEDIMENT TEST FOR VISIBLE DIRT ADOPTED IN CONNECTICUT

FRIEND LEE MICKLE, M.S., FELLOW A. P. H. A.

Director of Laboratories, Connecticut Department of Health, Hartford, Conn.

DURING 1926 it was brought to the attention of the Connecticut State Department of Health that the sediment test for visible dirt in milk, as carried out in several of the approved laboratories of the state, varied considerably in the technic used, although supposedly each laboratory had been conforming with the procedures specified in the *Standard Methods of Milk Analysis* of the American Public Health Association.

A meeting was called to which all interested persons were invited. At that time the fourth edition of *Standard Methods* (1923) was in use and each laboratory was using standards prepared in the manner specified in that report, by adding dirt to milk. By request, the standard discs used in each laboratory were brought to the meeting, and it was very evident that no close uniformity could be expected with the use of standards which varied so greatly. The variations seemed to be due primarily to the use of samples of dirt of different sizes of particles, different colors, to difference in technic in preparing standards and to a variety of ways of interpreting the directions in *Standard Methods*.

It was the consensus of the meeting that photographic standards prepared by one set of workers and supplied to all the laboratories in the state making the test would be the solution of the problem. A committee was appointed to make tests and prepare photographic standards. The studies made extended throughout the year, and one meeting

was held with the Referee of the Committee on Standard Methods of the American Public Health Association. Finally, on January 9, 1928, a second meeting of milk laboratory workers was called to discuss the report of the committee. The report was adopted with minor changes.

The method for the sediment test as given in the fifth edition of *Standard Methods of Milk Analysis* (1928) was adopted inasmuch as, during the time that had elapsed, the Fifth Edition had appeared recommending a photographic standard. A number of additional procedures, not in conflict with those of *Standard Methods*, were adopted to meet Connecticut conditions, however, because it was felt the method in the Fifth Edition does not provide sufficiently for the examination of bottled milk. It was found the bulk of laboratory milk examinations in Connecticut is of samples of bottled milk. A standard photograph, showing four additional gauges for use on bottled milk, has been prepared by the committee for distribution. All of these discs are graded as clean to conform with *Standard Methods*, but represent, respectively 0.25, 0.50, 0.75 and 1.00 mg. of dirt per pint. It was decided to return to the dairyman or health official the disc showing the dirt removed from each sample of milk attached to the report. Only the Wisconsin sediment tester and the discs of the type furnished by the manufacturer of that model were allowed where *Standard Methods* provides

that this or several other types of testers may be used.

The method, exactly as adopted at the meeting of milk laboratory workers, January, 1928, for use by all Connecticut approved laboratories, follows:

1. The method for the sediment test given in *Standard Methods of Milk Analysis* of the American Public Health Association and the Association of Official Agricultural Chemists, fifth edition, pages 32-34, was adopted. The following additional procedures which are not in conflict with those of *Standard Methods* were adopted to meet Connecticut conditions.

2. Pint samples only shall be regarded as standard. Where quart or any other size of sample is used, the report must state the size used. (The question of whether or not these results should be calculated to a pint basis, as recommended by the committee, was left undecided for later action with the provision that meantime each laboratory may so calculate or not as they prefer.)

3. Only the Wisconsin (Lorenz model) sediment tester shall be used.

4. Only the discs of the type furnished by the manufacturer of the Lorenz model shall be used, although they may be purchased from any source.

5. The sediment discs obtained from filtering samples of milk shall be graded against the photographs on page 33 of *Standard Methods* or against the extra prints of these photographs obtainable from the American Public Health Association, New York, N. Y. (These cost 75c each for either set A, B, or C or \$2.25 for the three sets of pictures on page 33 of *Standard Methods*.)

6. *Standard Methods* directions shall be interpreted to mean that no person shall prepare standards by adding dirt to milk.

7. The photographs show five gauges (see top of column opposite).

All samples shall be reported by one of the five descriptive terms above and also scored in terms of either 1.25, 2.50, 3.75 or 5.00 which are figures representing milligrams of dirt per pint. In order to avoid confusion the two

DESCRIPTION	MG. DIRT PER PINT
Clean	0.00
Fairly clean	1.25
Slightly dirty	2.50
Dirty	3.75
Very dirty	5.00

figures at the right of the decimal point should always be used whether or not the last figure is a cipher.

8. Percentage-clean figures and terms other than the above for expressing dirt in milk shall be completely abandoned.

9. No sample showing more than 1.25 mg. dirt per pint shall be reported within closer limits than the five gauges given above, the dairymen being given the benefit of any doubt in deciding between any two of the five gauges.

10. *Standard Methods* states where bottled milk is examined it should not show even 1.25 mg. dirt per pint. For milk reported as clean there shall be, for Connecticut use, an additional standard photograph of discs showing, respectively, 0.25, 0.50, 0.75 and 1.00 mg. dirt per pint. (Copies of this photograph may be obtained from the Bureau of Laboratories, State Department of Health, Hartford, Conn., at 50 cents apiece, mounted either on 3" x 5" or 4" x 6" filing cards, so long as the supply of both sizes lasts, providing you state a preference in ordering. Write Friend Lee Mickle, Chairman, Milk Sediment Committee.)

11. All milk samples graded as clean shall be reported in the following terms which are figures representing a milligram or fraction of a milligram of dirt per pint:

Clean	0.00
Clean	0.25
Clean	0.50
Clean	0.75
Clean	1.00

12. No clean sample shall be reported within closer limits than the five grades on the photograph, the dairyman being given the benefit of any doubt.

13. The discs shall be returned to the dairyman, health or dairy official, or milk inspector, together with the report.

BACTERIOLOGICAL METHODS OF EXAMINING ICE CREAM *

THE increasing interest in the sanitary control of ice cream stimulated the American Dairy Science Association to appoint a committee on bacteriological methods of analysis of this product. The report of this committee was published in a recent issue of the *Journal of Dairy Science*.¹

The first part of this report includes detailed directions for the agar plate, and direct microscopic methods of analysis as applied to ice cream. Directions are given for the preparation and sterilization of glassware for bacteriological work, and for the preparation of media for ice cream analysis. Considerable space is given to a discussion of the methods of sampling the various ingredients of ice cream, as well as the frozen product, and to the method of measuring the sample for the gravimetric and volumetric determinations.

The last part of the report involves a discussion of the value and significance of bacterial analysis in the sanitary control of ice cream. The importance of various factors in controlling the sanitary quality of ice cream, such as the quality of ingredients, plant sanitation, contamination from human sources, use of chemical disinfectants and steam, etc., are discussed in detail. Directions are given for taking samples to detect faulty conditions in the plant operation.

The report of this committee should be of interest to anyone who is attempting to do laboratory control work with ice cream.

Through the agency of the journals, the committee wishes to enlist the coöperation and assistance of everyone who is doing work along the line of labora-

tory control of ice cream. Any new methods or modifications of old methods which may have proved satisfactory will be gladly received by the committee. It is the desire and aim of this committee to serve as a medium through which improved methods may be collected and passed on to others. It is not intended to propose an official method, but rather to make available to the industry all bacteriological methods which have been found satisfactory.

It may be of interest to know that the American Dairy Science Association, through its General Committee on Bacteriologic Methods of Analyzing Dairy Products, with Dr. R. S. Breed as chairman, is contemplating the formulation of a complete set of bacteriological methods for all the dairy products. This general committee expects to function largely through sub-committees, composed of men who have had experience with the various dairy products. A sub-committee on methods for analyzing butter is now actively at work; another on condensed and powdered milk products has recently been appointed; and the sub-committee on ice cream has recently published the report referred to.¹ The sub-committee on ice cream consists of A. C. Fay, Chairman, Kansas Experiment Station, Manhattan, Kan.; F. W. Fabian, Michigan Experiment Station, East Lansing, Mich.; and B. W. Hammer, Iowa Experiment Station, Ames, Ia.

NOTE: The methods herein suggested have not come before the Committee on Standard Methods of the American Public Health Association for approval and, therefore, do not represent the opinion of the Association.

1. Bacteriological Methods of Examining Ice Cream. *J. Dairy Sci.*, 10, 5:460-478, 1927. The pre-publication demand for this report has necessitated a charge of 25 cents for reprints. They may be procured from Dr. Robert S. Breed, N. Y. Agr. Experiment Station, Geneva, N. Y.

* Submitted by a Committee from American Dairy Science Association.

VITAL STATISTICS

LOUIS I. DUBLIN, PH.D.

Mortality Experience of the Metropolitan Life Insurance Company for the First Quarter of 1928— The mortality records of the industrial policy holders of the Metropolitan Life Insurance Company show that the first quarter of 1928 shared with the corresponding period of 1927 the distinction of registering the lowest death rate (9.7 per 1,000) ever recorded for these 3 months among the industrial populations of the United States and Canada. Among approximately 16,000,000 white insured persons, the rate was only 8.8 but among about 2½ million colored persons, there was an increase to 15.9 per 1,000, from 15.5 last year; so that the composite figure for the two races showed no improvement.

The death rate for tuberculosis among the white policy holders was 72.0 per 100,000. This is not only a new minimum for any first quarter, but shows an improvement of 11 per cent over the previous minimum of 80.8 registered only last year. Within 2 years the tuberculosis death rate among white wage-earners has been cut by one-sixth. In half a decade it has been cut approximately one-third. It has been almost halved since 1920. Corresponding improvement has not been registered for the insured colored population, among whom there was actually a higher rate than during the early months of last year. Their rate of 229.3 for the quarter may be compared with 245.6 in 1923 and 310.1 in 1920, a drop of 26 per cent in 8 years.

The mortality record for the quarter shows gratifying declines among both white and colored for typhoid fever, scarlet fever and whooping cough. The

measles mortality shows a small drop for the whites and a large increase for the colored. The diphtheria situation is by no means encouraging, although the rate for the colored is lower than in 1927. Last year it was believed that the increase was only a temporary phase in a situation that had previously shown improvement for 6 continuous years. This viewpoint must now be discarded and a still more earnest campaign conducted for the immunization of children against this disease. The increased prevalence of meningococcus meningitis was reflected in a rather marked increase in the death rate among Metropolitan industrial policy holders. The combined mortality from influenza and pneumonia was a little higher than in the early part of 1927. Pneumonia, in particular, showed a considerable increase among the whites. Two other diseases of outstanding public health interest, diarrheal complaints and puerperal conditions, show improvement. In the case of the latter, the drop is considerable—more particularly among the colored.

The cancer rate for whites and colored persons during the first quarter was 75.3 per 100,000, as compared with 75.1 last year. The death rate for the whites declined a little during last year, and but for a very pronounced rise among the colored policy holders, the composite rate would have dropped slightly. The mortality from diabetes continues to increase—very slightly among the whites, but pronouncedly among the negroes. The conclusion that little benefit has as yet come to the urban negro as the result of the discovery of insulin, is inescapable. Insured urban negroes not only show a

sharply increasing diabetes death rate, but their rate is now higher than that of the whites. Suicides, homicides and accidents all registered lower death rates for both the white and the colored policy holders with the greater improvement in each instance resting with the latter. The death rate from automobile accidents for the whites increased 9.4 per cent over that for the first quarter of 1927 and 14.8 per cent over 1926. For the negroes there was an increase of 5 per cent over 1927 and 37.3 per cent over 1926.—*Stat. Bull.* 9:1-5 (Apr.), 1928.

Current State Mortality Statistics

—The U. S. Public Health Service has begun publication of tables from the monthly mortality reports of state health departments for the latest month for which published records are available. Statistics of most communicable diseases are not included, since they are available in other tabulations in the *Public Health Reports*. Statistics of deaths from other causes are limited for the most part to those causes which appear in the state reports. In the case of states which publish detailed mortality reports each month, the record of only the principal groups of causes and certain important specific causes have been used.

For purposes of comparison, the mortality records for the corresponding month in a few preceding years have been compiled. The rates have been computed upon the populations as estimated for July 1 of each year represented. These tabulations will be enlarged as the current data on mortality from additional states become available.—*Pub. Health Rep.* 43:743 (Mar. 30), 1928.

The Health Record of University Students as Related to Tonsillectomy
—Twenty-eight per cent of the 978 men students and 32.5 per cent of the 578

women students of the class of 1926 at the University of Michigan had had their tonsils removed before entering college. In the class of 1929 this figure had risen to 35 per cent of the 1523 men students. Data from the records taken at entrance and during the college course fail to show any significant difference between the health of the two groups. There was slight advantage, however, to the tonsillectomized group in general health and nutrition.

Only 6 per cent of the 275 students with their tonsils removed, and 16 per cent of 703 students with tonsils, had had cervical adenopathy. The tonsillectomized students had more trouble with upper acute respiratory infections, 63 per cent of 537 tonsillectomized students suffering thus, in comparison with 45 per cent of the 986 non-tonsillectomized ones.—Warren E. Forsythe, *Pub. Health Rep.* 43:560-563 (Mar. 9), 1928.

Mortality Statistics of Prussia, 1926—In Prussia, exclusive of the Saar region, the total number of deaths in 1926 and 1925 was 445,754 and 450,973, respectively, or 115.9 and 118.5, respectively, per 10,000 population. The death rate for 1926 declined by 2.6 per 10,000 population, as compared with that of 1925. In 1925, the reduction in the total number of deaths, as against 1924, 3.3 per 10,000 population, whereas, from 1923 to 1924, a reduction of 13.7 per 10,000 population, had been recorded. Almost one-fourth (22.9 per cent) of the deaths recorded in 1926 (102,269, or 26.6 per 10,000 population) resulted from transmissible diseases. The rate per 10,000 population for the remaining causes of death was as follows (the rates for 1925 being in parenthesis): diseases of the circulatory organs, 17.1 (17.1); senile weakness, 12.1 (12.1); cancer and other neoplasms, 11.2 (10.8); cerebral hemorrhage and other diseases of the nervous system,

9.6 (9.8); diseases of digestive organs, 9.0 (9.3); congenital lack of vitality and developmental defects, 6.8 (7.3); diseases of the respiratory organs, 4.5 (4.4); accidents or other violent forces, 3.8 (4.0); diseases of the urinary or genital organs, 3.0 (2.9); suicide, 2.5 (2.4); deaths in childbed, exclusive of childbed fever, 0.5 (0.5); murder and homicide, 0.2 (0.2).—*J. A. M. A.* 90:995 (Mar. 24), 1928.

Public Health in Palestine and Trans-Jordania, 1926 — The report made by H. M. Government to the Council of the League of Nations on the administration of Palestine and Trans-Jordania for the year 1926 has been issued from the Colonial Office. In regard to Palestine it is stated that the general health of the community was satisfactory, apart from the heavy incidence of enteric fever and dysentery in certain populous settlements, where conditions of sanitation and housing were bad. The estimated population at July 1, 1926, was 761,896 (excluding Bedouin). Births during the year numbered 40,721, or 53.45 per 1,000 population; and deaths 18,623, or 24.44 per 1,000. Infant mortality was 6,644 or 163.15 per 1,000 births. There were 1,400 cases of enteric fever, with 110 deaths, and 1,732 of dysentery, with 37 deaths. There has been no serious outbreak of any other infectious disease, and no case of cholera or smallpox. An intensive campaign of revaccination against smallpox was carried out in the spring, when 170,881 vaccinations were performed. The last years have seen a remarkable growth of infant welfare work in Palestine.

The number of immigrants during the year was 13,910 (6,276 men, 4,864 women, and 2,770 children), of whom

13,081 were Jews. The figures present a striking contrast to those for the year 1925, when 34,641 immigrants entered the country, of whom 33,801 were of Jewish race. The total number of emigrants during the year was 9,429, of whom 7,735 had settled in the country only since 1920. Three-quarters of the emigrants were working men and women. The volume of unemployment increased constantly throughout the year from 3,000 at the end of 1925 to 8,000 at the end of 1926.—*Lancet* 2:1425 (Dec. 31), 1927.

The Value of Prenatal Care—There were 3217 mothers delivered in the obstetrical department of the Louisville City Hospital from April 1, 1923, to July 1, 1927. Of these 1,156 had received no prenatal care at the hospital clinic. The remaining 2,061 were registered in the clinic and had made at least 1 visit. Among the 2,061 patients receiving prenatal care there were 6 maternal deaths, a mortality rate of 2.9 mothers per 1,000 deliveries. The maternal deaths among 1,156 non-clinic patients numbered 26, giving a death rate of 22.4 per 1,000 deliveries. In 1927 there were no maternal deaths among the 658 prenatal clinic patients.

Fetal and neonatal deaths calculated on the basis of the total number of deliveries show a mortality of 7.5 per cent among the clinic patients and 22.6 per cent among the non-clinic. There were 35 cases of eclampsia among the non-clinic mothers; 10 of these patients died giving a mortality of 8.5 deaths per 1,000 deliveries. Eclampsia developed in 12 of the clinic patients, due to inadequate prenatal care, but none of them died.—Alice N. Pickett. *Kentucky State M. J.*, Feb., 1928.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

Restaurant Inspection—The Bureau of Food and Drugs of the New Jersey State Department of Health has been carrying on an active campaign toward inspection of eating places within the state. Items covered by their inspections include facilities for handling and preserving all foods, methods of serving ice water, lighting and ventilation facilities, general cleanliness of the kitchen, disposal of garbage, protection against flies and roaches, cleansing of dishes and utensils and sanitation facilities provided for employes. While it is appreciated that the technic of making a really valuable inspection of food handling establishments is not simple, the inspectors of the state department are endeavoring to cooperate with local health officials in inaugurating a restaurant inspection program. A. G. Wigley and A. I. Goehrig. *Am. City*, 38:155 (Feb.), 1928. Abstr. W. L. Havens.

Avoiding Pollution by Coke Oven Wastes—Phenol or carbolic acid is a product of destructive distillation of coal, and is present to the extent of less than 0.5 per cent in the ammonia liquor which condenses out of raw coke-oven gas. In the process of lime treatment of this ammonia liquor, the phenol combines to form calcium phenolate which passes into the sewers as still waste. Subsequent action of acids and carbon-dioxide in the water reduces the calcium phenolate to phenol which in the event of subsequent chlorine sterilization of the water produces the pronounced and disagreeable chlorophenol taste.

Investigations in late years have attempted to remove the phenols prior to

the lime treatment. Two successful methods were evolved; namely, the benzol extraction method and the patented Tiddy-Hoffner or distillation method. Description of the first method is given, together with sketch of process and accompanying formula and reactions. Through operation of this benzol extraction method, the extraction efficiency has been raised over 96 per cent. More than 25,000 gallons of pure phenol are recovered yearly from the 36,000 gallons of ammonia liquor treated daily. The plant is financially self-supporting. Hugh E. Jones. *Water Works Eng.*, 81:141 (Feb. 1), 1928. Abstr. Chester Cohen.

Odor Nuisances at Sewage Works: the Use of Chlorine—Emanating from sewers and sewage plants are several different odors. Hydrogen sulphide has been shown to be the most serious of the odor-producing gases and is also destructive to masonry structures.

In odor control, prevention rather than destruction is a chief objective. The introduction of chlorine at a point where sewage is fresh is important, though frequently the sewage becomes stale before a major portion of it can be collected for treatment.

Where odor production exists, the following conditions seemingly must occur simultaneously: (1) presence of sulphates; (2) hydrogen sulphide-producing bacteria; (3) temperature sufficiently high to promote rapid growth of sulphide-splitting organisms, and (4) period of time necessary for producing hydrogen sulphide. Elimination of but one of these factors will result in securing effective control of hydrogen-sulphide generation.

Odor destruction consists primarily in splitting up the hydrogen sulphide in sewage.

Another factor in odor control is the effect of the course of the sewage, whereby an intimate mixture may be caused between fresh sewage and liquid heavily laden with hydrogen sulphide. Saving in chlorine consumption may be effected by changes in flow chambers to prevent disturbance of the lower 5 feet of liquid in the chamber. Chlorine application to the influent will effect complete odor elimination at moderate expense. On the whole, odor control is much more readily effected at separate sludge digestion plants.

In conclusion, examples are given of chlorination for odor control at Neodesha and Independence, Kan. L. H. Enslow. *Surv.*, 73:183 (Feb. 3), 1928. Abstr. H. W. Streeter.

A Comparison of the Temperature and Bacterial Count of Milk and Foam During Certain Stages of Pasteurization—This article includes a complete description of the apparatus and methods employed, including the construction, placement and operation of the thermocouples. Studies were made under conditions of normal operation at plants using the batch method of pasteurization.

Bacterial count of foam was higher in every instance than that of the milk. During pasteurization the bacterial count of milk decreased, while in 66.7 per cent of the tests the count in the foam increased. Bacterial count of foam varied greatly at different points in vats. Depth of foam did not affect bacterial reduction. If vats are tightly closed, bacterial content of foam is reduced.

The temperature of the air above the foam, and of the foam itself was in every instance lower than that of the milk. The amount of foam varied in area from

small patches to the entire surface of the vat and in depth from $\frac{1}{2}$ to 4 inches. In no case was the foam raised to a satisfactory pasteurizing temperature. H. W. Whittaker and R. W. Archibald. U. S. Dept. of Agriculture *Tech. Bulletin No. 18*, Sept. 1927, 11 pp. Abstr. C. T. Butterfield.

Controle Technique d'une Installation Municipale de Sterilisation d'eau par l'ozone. (Control of a Municipal Plant for Purification of Water by Ozone)—A description of the water disinfecting plant of the City of Boulogne consisting of an ozonizer and the circulating system for ozonized air and the sterilizer or disinfecting unit. The ozonizer consists of a series of glass cylinders, a coaxial aluminum rod which serves as one electrode and the aluminum enclosing case serving as the other electrode. A single phase, 50 cycle, alternating current transformed to 8,000-10,000 volts is applied to the electrodes. Air dried by calcium chloride is forced through the cylinders in which the silent electrical discharge occurs generating the ozone. This ozonized air is forced through a sterilizer, consisting of a vertical tower of reinforced concrete divided at intervals by horizontal partitions of perforated celluloid to insure intimate contact between the water and the ozonized air, both of which enter at the base of the tower. The effluent from the sterilizer is tested periodically with starch iodide for free ozone and in the manner used for determining the residual chlorine in water. Bacteriological data are given indicating that the number of *B. coli* per liter was reduced from 1,000 to 0 and the gelatine count was reduced from 714 to 6 per c.c. The plant, with a capacity of 10,000 gal. per hr., consumes 0.65 K.W. hrs. of current to operate the ozonizer, consisting of two units of 3 cylinders each, and an additional 1.1 K.W. hr. to operate the air compressor.

J. Salmon and P. Quarre. *Bull. Hyg.* 2:978 (Dec.), 1927. Abstr. C. R. Cox.

Colorado State Board of Health, Division of Sanitary Engineering, Laws and Regulations—This is a 34-page leaflet issued in 1927. In it appear either compilations or the text of state laws of Colorado and of the rules of the State Board of Health relating to public water supplies, water purification plants, sewer systems, sewage treatment plants, municipal garbage collection and disposal, rural and camp sanitation, swimming pools and other public bathing places, irrigation with sewage, etc., being of usual concern to the sanitary engineering divisions. The leaflet is unusually embracive, giving for example the high lights of the district improvement acts for financing sewers and water systems and the laws relating to eminent domain. Issued by Colo. State Board of Health, Denver, Colo. Abstr. C. G. Gillespie.

Cyanide Waste Poured Into Stream Poisons Livestock—Cattle died soon after drinking water from a small stream into which was discharged the effluent from an Imhoff tank, intermittent sand filter disposal plant. Investigation disclosed that on this particular day a 600 gal. vat of electrolyte, which among other salts contained 2 lbs. of sodium cyanide per gal., had been dumped into the sewer by mistake. The question arises as to what effect small amounts of this substance will have upon the bacterial flora of sewage disposal systems. A. H. Wieters. *Water Works Eng.*, 81:204 (Feb. 15), 1928. Abstr. H. E. Miller.

Spent Gas Liquor in Relation to Sewage Disposal—Spent gas liquor is dangerous to fish life and cattle and detrimental to small streams, as its oxygen absorbing qualities prevent and retard self-purification. The difficulties of dealing with gas liquor have become more acute because of: (a) the increased

manufacture of gas for domestic uses: (b) the introduction of vertical retorts with use of steam, thereby increasing the volume of gas liquors, and (c) the adoption of the activated sludge method of sewage disposal. With vertical retorts, 76 gallons of spent liquor are produced per ton of coal, whereas with horizontal retorts, 50 gallons are produced. The efficiency of the activated sludge process is likely to be affected by the presence of unduly high amounts of spent gas liquor in the sewage treated. Because of its high oxygen-absorption power, the admixture of the spent liquor with crude sewage requires greater aerobic activity in the treatment of such mixtures, usually necessitating an increased purifying area.

It is possible, by several measures named, to diminish the amount of gas liquor produced; likewise to purify the liquor before its discharge into sewers. In the latter connection, it is noted that if the volume of spent gas liquor does not exceed 1 per cent of the volume of domestic sewage, and is introduced into the sewers in a small steady flow, the mixture can be purified without difficulty. Experiments made on treatment of the spent liquor have indicated that when diluted until the 4-hour oxygen absorption value is 4000 p.p.m., the liquor itself is amenable to biological filtration, which at a rate of 15 gals. per cu.yd. per day of 8 hrs., reduced the oxygen absorbed by 90 per cent, and a second filtration at a rate of 12 gals. per cu.yd. produced an effluent absorbing less than 20 p.p.m. of dissolved oxygen.

In conclusion, it is stated that the discharge of spent gas liquors into sewers should be as far as possible uniform and proportionate to the flow of domestic sewage. The construction of equalizing tanks for this purpose offers no engineering difficulties. H. Ross Hooper. *Surv.*, 73:111 (Jan. 27), 1928. Abstr. H. W. Streeter.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M.D., AND LEONARD GREENBURG, PH. D.

The Practical Application of Two Qualitative Tests for HCN in Ship Fumigation—This investigation was undertaken with the purpose of establishing a simple chemical test for the determination of HCN in practical ship fumigation. The importance of such a test in determining the time at which a vessel may be entered by the fumigating or the vessel crew is obvious.

The following criteria were laid down as being necessary for the test:

1. The test should be definite under all conditions, at or above the predetermined danger point to human life.

2. It should be such as can be applied without attendant danger to those making it.

3. The time factor of its reaction should be slow enough to permit of accurate computation with an ordinary watch in the hands of the usual personnel engaged in this work.

4. The test should be efficient within at least 10 per cent of error as to time.

5. The varying atmospheric conditions at seaports should not materially affect the application of the test.

Both tests herein described depend on the change in color of filter paper which has been previously immersed in certain solutions. The first test consisted in the use of benzidine copper acetate. This test is valid only where no disturbing constituents may enter the reaction; for example, such cases as chlorine and nitric acid. Study, however, revealed the fact that the reaction time was so rapid that an error of but three seconds might mean an error of 30 per cent or more in the efficiency of the test.

The second method which was studied was the methyl orange-mercuric chloride mixture. This is a color test depending on the change of color of a No. 40 What-

man filter paper, treated with this solution, to which has been added a specific amount of glycerine. On exposure to HCN gas this paper, which is an orange color, turns pink.

In conducting these tests, amounts of HCN, varying from 6.7 to 0.21 gm., were used per 1000 cu. ft. of air, and the study indicated that there is an approximate ratio between the concentration of HCN, the time of exposure, and the color of the test paper. A series of 55 comparative tests were made on 10 vessels using these test papers and white rats, in order to estimate the degree of toxicity of the atmosphere. It was found that these test papers are very satisfactory for the purpose intended.

One difficulty, however, arose, namely the maintenance and use of the test papers under certain conditions of humidity. When attention was paid to the keeping of the papers at a relative humidity of 70 to 75 per cent they were found to yield results of good practical value.

Chloro-picric acid, which is an ingredient of certain ship disinfectants, was found not to affect this test paper on six minute's exposure.—G. C. Sherrard, *Pub. Health Rep.*, 43, 17:1016-1022 (Apr. 27), 1928. L. G.

Some Clinical and Pathologic Observations On Silicosis in Ontario—During the course of dust studies, conducted by the Division of Industrial Hygiene of the Ontario Department of Health, 1487 men were examined clinically and by means of the X-ray. Nineteen pairs of lungs obtained at post-mortem were studied and the percent-

age of silica, estimated at SiO_2 , in the ash of these lungs was determined. The silica content of the lungs was determined by digesting and igniting the lung tissue, and finally a hydrofluoric analysis of the residue. Most of the men examined were exposed to dust containing silica, a few exceptions being added as controls. The dust varied from 2 per cent to 99 per cent in silica content, estimated as SiO_2 . A discussion is presented showing the relation between the condition of the worker prior to death and the pathological findings of his lungs on autopsy. The lowest amount of silica found in this survey to be involved in the production of silicosis was from 10 per cent to 14 per cent.—Andrew R. Riddell, and H. E. Rothwell, *J. Indust. Hyg.*, 10, 5:147-157 (May), 1928. L. G.

Fatal Accidents From Electric Shock in Recent Years—From this brief committee report one may conclude that the fatality rate from electric shock in the United States (0.9 per 100,000) is somewhat higher than that for Switzerland (0.7 per 100,000), and both of these countries have rates greatly in excess of that for England and Wales (less than 0.1 per 100,000).

An interesting table is presented which shows the number of fatal accidents from low voltage circuits (110 to 550 volts). It would appear from this that low voltage circuits are definitely responsible for approximately 75 deaths for the period 1912 to 1926. The conclusion is evident that these low voltage circuits must be reckoned with in accident prevention work of this type.

The committee recommends that education of the public in precautionary measures and the importance of using only first class household equipment be urged, and that continued education of the employes of electrical industries, as well as the development of methods of resuscitation for cases of cardiac fail-

ure, be undertaken.—*J. Indust. Hyg.*, 10, 4:111-116 (Apr.), 1928. L. G.

The Problem of Automobile Exhaust Gas in Streets and Repair Shops of Large Cities—The atmosphere of 14 cities in the United States was sampled by taking "grab" samples in 500 c.c. glass bulbs. The samples were representative of the atmosphere at the breathing level of the usual pedestrian, in general some 20 or 30 feet from the street intersection, and at the time of peak automobile traffic. Other samples were taken in repair shops, and a third group in automobile busses.

The samples were analyzed for carbon monoxide by the iodine pentoxide method, using liquid air for the removal of the unburned gasoline and other interfering substances. The method probably has an accuracy of 1/10 part of carbon monoxide in 10,000 parts of air.

In all, 141 street samples were taken, yielding an average of 0.8 part of carbon monoxide per 10,000 and a range of from 0.2 to 2.9 parts per 10,000. One hundred and two samples were taken in automobile repair shops. They yielded an average of 2.1 parts per 10,000 and a range of 0.2 and 11.0 parts per 10,000. But 7 samples were taken in automobile busses. These averaged 0.5 parts and a range of from 0.1 to 1.0 parts per 10,000.

The authors conclude that no hazard exists in the automobile busses tested and that to the ordinary pedestrian no carbon monoxide hazard exists in the city streets; the police traffic officers are the only exception to this rule, and the potential hazard to these officers may be minimized by diminishing the duration of exposure. In striking contrast with these results, however, are those of the garage repair shops. The authors consider that a dangerous condition demanding serious consideration exists in these establishments. Certain precautions concerning the operation of cars in

repair shops are discussed.—J. J. Bloomfield, and H. S. Isbell, *Pub. Health Rep.* 43, 13:750-765 (Mar. 30), 1928. L. G.

Effects of Dust Upon Coal Trimmers—In the statistical portions of this paper the authors present an analysis of 426 deaths between the years 1910 and 1926, obtained from the Coal Trimmers' Union. When compared with deaths among the male population of England and Wales for the same years this material indicates that coal trimmers have a somewhat lower rate from phthisis and a distinctly higher rate from bronchitis and pneumonia than have the male population of England and Wales. Statistical evidence, calculated as percentage of deaths from certain causes of the total deaths for the years 1910-1912 for England and Wales, is also discussed, and this evidence appears to indicate that coal heavers have approximately the standard rate from phthisis, cancer and circulatory diseases, a higher rate from bronchitis, and a much higher rate from pneumonia. Comparative mortality figures for phthisis, bronchitis and pneumonia for the years 1921-1923 and for all occupied and retired males, all coal miners, and for coal boat loaders and dischargers is presented. These figures serve to corroborate the statistics previously discussed in indicating that coal miners suffered a somewhat lower phthisis rate and that coal miners and coal boat loaders suffered a greatly increased bronchitis and pneumonia rate.

Radiographs and case histories are presented of some of the coal operatives which indicate that the chests of these men are not normal, yet the authors feel that these must not be confused with the silicotic fibrosis of silica workers.

The statistics of the Coal Trimmers' Union included 51 cases of cancer. Eleven, or 22 per cent, were cases of cancer of the skin, in contrast to but 3.3 per cent of cases of cutaneous

cancer among males in England and Wales for the year 1925. The 5 cases of cancer of the skin of the neck are considered noteworthy by the authors. On the other hand, cancers of the intestines, etc., amounted to but 6 per cent, as contrasted with 23 per cent for England and Wales.—Edgar L. Collis, and J. C. Gilchrist, *J. Indust. Hyg.*, 10, 4:101-110 (Apr.), 1928. L. G.

Arsine Intoxication: A Case of Suspected Poisoning in the Steel Industry—The "pickling" of metal in acid baths for the removal of "mill scale" may lead to the production of arseniureted hydrogen (AsH_3) or arsine. The present report deals with the industrial and clinical history of a worker engaged in "pickling" sheets of rolled metal in a 5 per cent sulphuric acid bath. The worker was employed for approximately 9 months in handling these sheets of metal. A short time after he had changed his employment he complained of a feeling of tightness across the chest, difficulty in breathing, and a generalized feeling of weakness. His skin presented a scaly, peculiar bronzed appearance which grew progressively worse until he developed tremors and paresthesias of the muscles of the arms and legs, and finally complete paralysis of these members. The report presents an interesting inquiry into the various factors surrounding his work and the materials with which he was engaged, in an effort to decide whether or not the industrial environment might constitute the source of his poisoning. A 473 liter sample of air taken at a representative position in the workroom was found to contain less than 1/1000 mg. of arsine. The conclusion is reached that the man's industrial occupation was not responsible for his poisoning.—C. W. Muehlberger, A. S. Loevenhart, and T. S. O'Malley, *J. Indust. Hyg.*, 10, 5:137-146 (May), 1928.

FOODS, DRUGS AND NUTRITION

WALTER S. FRISBIE

Gassy Fermentations in Reheated or Processed Cheese Products Containing Pimentos—Manufacturers of cream cheese, loaf cheese and cheese spreads experience considerable difficulty from gassy fermentations when pimentos are incorporated in these products. Reheated or processed cheese products are particularly favorable media for the growth of bacteria. By observing certain precautions in manufacture it is possible to protect reheated or processed cheese products from contamination with gas producing bacteria from every source except the cheese itself. Contamination from this source might also be controlled and the gassy fermentation prevented if it were economically possible to use only the best quality of cheese. Inasmuch as a certain amount of cheese of poor quality is always used, the possible presence of gas producing bacteria must be accepted. Sterilization of the manufactured products is obviously impossible. By removing the fermentable carbohydrate from the pimentos an attempt was made to render the products less favorable as media for the development of the gas producing bacteria. Experiments were conducted wherein pimentos were washed in double their weight of tap water three times in 30 minutes. They were then allowed to stand in fresh water for 18 hours, rinsed in fresh water, ground and sterilized. When pimentos thus washed and sterilized were added to plain cheese spread, no gas developed. The experiments were repeated a number of times with confirmatory results. The washing which is believed to be excessive and which can probably be lessened removes some flavor

and color from the pimentos. The method has not been tried on a factory scale. The findings are applicable to all food products in which pimentos are incorporated which are subject to a gassy fermentation.—W. R. Albus and S. H. Ayers, *J. Dairy Sci.*, 11:175 (May), 1928.

Seasonal Variations in the Antirachitic Value of Sunlight—This article is a review of an address delivered at Kansas City before the Interstate Post-Graduate Medical Association by Dr. Alan Brown and Dr. F. F. Tisdall. At Toronto rats fed on a rachitogenic diet were placed out of doors from 11 a. m. to 1 p. m. daily, control animals on the same diet being kept in the dark during the experimental period. Each week throughout the year batches of rats were started under these conditions and after a month each batch was killed and examined for signs of rickets. The results showed that in Toronto even winter sunshine had slight antirachitic value, but from the end of February onward, this value increased sharply, corresponding with an increase in the shorter rays of the solar spectrum. The biological test bears very little relationship to meteorological records of sunshine during the corresponding periods, owing to the ease with which the effective rays are absorbed. A second series of experiments designed to test the relative values of direct sunshine and of "sky-shine" demonstrated that the scattered rays were from one-half to two-thirds as effective as the direct sunshine, a point of practical importance as indicating a means of applying an efficient dose of

ultra-violet rays in cases where radiant heat is undesirable. Animals exposed to light were not only protected from rickets but also showed an increased resistance to deliberate infection. The intestinal contents of the irradiated rats were found to be more acid than those of the controls, indicating a better digestion in the former.—Anon., *Lancet*, 214:715 (Apr. 7), 1928.

Pellagra-like Lesions Associated With Deficiency of Vitamin B₁ in the Rat—The experiments here recorded confirm those of Goldberger and his colleagues as to the presence of two vitamins in yeast. The presence of both factors is necessary for the normal growth of the rat. In the absence of the thermo-labile vitamin B₁ there is a failure of growth, loss of appetite and a terminal fall of body temperature with the histological appearances characteristic of starvation. There may or may not be symptoms of polyneuritis followed by death in from 4 to 6 weeks. The condition resulting from the deficiency of vitamin B₁ is very similar to that arising from vitamin B deficiency.

In vitamin B₂ deficiency there are characteristics symmetrically arranged skin lesions, together with ulceration of the tongue and buccal mucosa. The changes are very similar to those of pellagra in man. A papillomatous condition of the cardiac portion of the stomach is common in rats deprived of vitamin B₂ and in animals dying as the result of this deficiency there are found the histological changes associated with inanition.—G. M. Findlay, *J. Path. & Bact.*, 31: 353 (Apr.), 1928.

An Unusual Case of Food Poisoning—This case of food poisoning, which was found to be due to *B. aertrycke* probably transmitted in pork pie, presented certain unusual features. The poisoning spent itself on the upper

intestinal tract causing vomiting and pain but no diarrhea or signs of enteritis. There were some indications of paratyphoid fever and nocturnal rise of temperature, which is unusual in food poisoning cases. A serological investigation revealed the presence of 1:25 agglutinability to *B. aertrycke* (Mutton) and complete absence of agglutinins to *B. typhosus*, *B. paratyphosus* A, B or C, to *B. enteritidis* (Gaertner), *B. aertrycke* (Newport) and to the dysentery group. From the feces of the patient, an organism was isolated which gave cultural reactions of the Salmonella group and displayed marked flocculation in a dilution of 1:25 with *B. aertrycke* serum (Mutton type). Four days before the onset of the illness the patient had partaken of some pork pie and three other members of the household who had also partaken had suffered from slight malaise, nausea and vomiting from 1 to 3 days after this meal.—F. M. Rowland, F. W. Marshall and J. Menton, *Brit. M. J.*, 3506:439 (Mar.), 1928.

A New Differential Medium for the Paratyphoid Group—The authors devised a new culture medium for differentiating members of the paratyphoid group. This medium has the following composition.

Agar	0.20 gm.
Distilled water	1000 c.c.
Alcoholic solution of phenol red (0.2%)	12 c.c.
Difco peptone	10 gm.
Sodium potassium tartrate (Rochelle salts)	10 gm.

The medium used should be adjusted to a pH of 7.6-7.8 and is best used in tubes, unslanted, a stab inoculation being made. Observations should be made at 24 and 48 hour intervals, although the reaction in tubes is generally stable, for at least 7 days. The paratyphoid strains that impart an acid reaction to the medium give a distinct yellow color in the lower portion of the

tube, with a surface zone of from 4 to 7 mm. which remains red, while those strains that produce an alkaline reaction give a diffuse homogeneous reddish coloration. *B. aertrycke*, *B. enteritidis*, *B. suispestifer* and *B. abortivo-equinus* gave acid reaction in this medium while alkaline reaction was produced by *B. schottmülleri* and *B. paratyphosus A*. Attempts to devise a plating method with this medium were only partially successful. In the experience of the authors this medium has given a perfectly definite differentiation with a large number of strains (87 *B. aertrycke*, 45 *B. schottmülleri*) previously identified by the agglutinin absorption method.—E. O. Jordan and P. H. Harmon, *J. Infect. Dis.*, 42:238 (Mar.), 1928.

The Vitamins of Commercially Concentrated Orange Juice—In a previous investigation it was shown that 5 c.c. and 10 c.c. of fresh ripe California orange juice were doses adequate in vitamin A and vitamin B respectively for the requirements of the albino rat. Using the same breed of animals and an identical technic, a product prepared from the juice of the same species of orange by concentration *in vacuo* was found to meet the nutritive needs of the animals as regards vitamin A and vitamin B at the same level in each case. The two investigations were run in close succession and the conditions of experiment were maintained as far as possible identical. It can be concluded that the content of vitamin A and vitamin B of fresh ripe California orange juice survives the industrial process of concen-

tration by the method of vacuum distillation at 37°C. without apparent loss, at least in the case when the resulting concentrate is of fairly recent manufacture. From a review of the literature the author states that vitamin C also is preserved without loss when orange juice is concentrated at a low temperature *in vacuo*.—S. G. Willimott, *Biochem. J.*, 2, 22:535, 1928.

Iodine Content of Some Water Supplies in Goitrous Regions—The following determinations of iodine in drinking water of goitrous regions are uniformly low, except in the case of Lasalle, Ill. Lasalle has two water supplies. It is stated that there is less goiter among those persons drinking water from these drift wells than the other source of supply, not analyzed.

Source	Iodine (parts per billion)
Litchfield, Ill. Impounding Reservoir	0.17
Chicago, Ill. Lake Michigan	0.13
Peru, Ill. Rock Wells (1300 ft)	0.31
Peoria, Ill. Drift Wells	0.15
Lasalle, Ill. Drift Wells	18.00
E. St. Louis, Ill. Mississippi River	0.29
Champaign-Urbana, Ill. Drift Wells	1.01
Murphysboro, Ill. Big Muddy River	0.30
Springfield, Ill. Direct from wells	0.50
Springfield, Ill. Filtration Galleries	0.52
Duluth, Minn. Spring	0.014
Grantsville, Utah	1.33

—Gertrude H. Beckwith, *Proc. Soc. Exper. Biol. & Med.*, 25:117 (Nov.), 1927.

CHILD HYGIENE

MERRILL E. CHAMPION, M.D.

Emotional Factors in Nutrition Work With Children—Both the metabolic stability and the action of the gastrointestinal system are closely allied to and seriously affected by the emotional state of the individual.

In a group of malnourished children studied at the Institute for Juvenile Research, the condition in some cases could be traced to the presence of organic or functional disease, in others to food inadequate in kind. A third group remained in which neither of the aforementioned causes could be found but rather, a definite emotional disturbance which was interfering with the nutrition. Causes of such neurotic tendencies may be traced to very early influences. The period of nursing even is a formative one and should therefore be so controlled that the child acquires not only the proper attitude toward feeding but also the proper habit training. With a lack of such discipline, which indeed requires forethought and understanding on the part of the parents, a child with definite neurotic manifestations will be the result, a problem much more difficult to cope with as the child grows older and which may, eventually, for treatment lead to the necessity of a temporary separation of the child and the parents. In a nursery school or in a hospital where the child has the opportunity to eat with and imitate others of his age there is less tendency for him to demand his own way. He will act with the group.

The method of preventing and overcoming the type of problem discussed, that is, the child malnourished because of emotional disturbances due to environmental conditions, is by means of preventive pediatrics and mental hygiene. —Emotional Factors in Nutrition Work

With Children, George J. Mohr, M.D., *Mental Hyg.*, XII: 2 (Apr.), 1928.

Mental Hygiene Even for the Feeble-minded—"On this whole problem of feeble-mindedness we are tarrying too long on the bridge of mental levels with its I. Q. buttresses. It is time that we crossed over to the other side into the less definite but far more interesting and practical realm of this problem," thinks Dr. George L. Wallace, widely known in this country for his work with the feeble-minded and for his administrative success with the School for Feeble-minded at Wrentham, Mass. He feels that in our worry about the I. Q. and mental levels we often fail to see the feeble-minded problem as it really is; in other words, that we overlook the fact that we are dealing with a condition and not a theory. The problem with the moron is lack of social adjustment. This is proved by the fact that we daily see many morons in a community without recognizing them because they have managed to adjust themselves adequately. Intellectually lacking, they react normally to their environment. On the other hand, those who do not react normally react quite similarly to those who, as Wallace says, make trouble on the higher mental levels such as pathological liars, thieves, neurasthenics, etc.

This being the case, the ideas expressed in the article in question indicate that there should be something more done than diagnosing mental retardation and creating special classes for the education of children at low mental levels. It is equally important that there be application of the principles of mental hygiene in connection with special class work so that many children other-

wise liabilities may be adjusted to their environment in childhood and so avoid becoming social failures in adult life. This program, of course, would go hand in hand with one for increasing facilities for the institutional care of the feeble-minded in need of it.—George L. Wallace, M.D., *Mental Hyg. Bull.*, Apr., 1928.

Practicing What They Preach—Very practical inducements are offered by the Vassar Brothers Hospital in Poughkeepsie, N. Y., to prospective mothers to get adequate prenatal care. This hospital has set aside the entire third floor for maternity work and offers to prospective mothers of the community a flat rate of \$65 for all semi-private patients whose prenatal care has been adequate. This charge includes all laboratory examinations made at the hospital, use of the delivery room, and board and care of the mother and baby, regardless of the length of stay in the hospital. The only requirement is a record of prenatal care. A further statement is made that for ward patients a flat rate of \$35 is offered on a basis similar to the above, with the possibility that those unable to meet this charge can have a still further adjustment.

Poughkeepsie is evidently spurred on to this highly constructive step by the fact that their maternal death rate is 63 per cent higher than that for the entire state and their infant mortality rate is 46 per cent higher. They are relying upon the prenatal care to produce a change in this situation and feel encouraged in that belief by the work accomplished by four public health nurses in Tioga County which apparently was responsible, in part at least, for a reduction in the mortality amongst mothers and children cared for.

A further commendable step has been taken by the hospital in sending to each of the 125 members of its staff a copy of *Standards of Prenatal Care* (supplied

by the New York State Department of Health) and record forms for patients.—*Health News*, Apr. 16, 1928.

The Infrequency of Severe Rickets In New Orleans And Vicinity—One of the interesting facts concerning rickets is its variation in occurrence throughout the different sections of the country. Forbes and Green found the incidence of the disease to be 25 per cent in Denver in 1925; Morse found it to be 80 per cent in Boston in 1900. From New Orleans, where the average is 45 per cent among children 3 years old or less, Dr. Williams reports a study of 100 children where an effort was made to determine if possible reasons for the comparatively low percentage in that vicinity and any other conditions pertinent to the knowledge of rickets as a disease.

Over a period of a year, it was found that there was a seasonal variation in the content of inorganic phosphorus in the blood of the group as a whole; that most of the calcium readings were normal while the inorganic phosphorus was low in every case of diagnosed rickets. There was a direct correlation between the inorganic phosphorus content of the blood and the possible sunshine for each month. Among the breast-fed infants, there was a lower incidence of rickets with a definite relationship to the health of the mother and to the nutrition and the care given herself and the baby. Of the breast-fed infants who developed rickets, of which there were 3, 2 were being nursed by mothers who did not eat green vegetables. Among the 100 children studied, 26 per cent had rickets.

The conclusion formed is that because of its geographical location New Orleans is able to report not only a low percentage of rickets but also a mild form of the disease.—The Infrequency of Severe Rickets in New Orleans and Vicinity, C. T. Williams, M.D., *Am. J. Dis. Child.*, 3514, Apr., 1928.

PUBLIC HEALTH NURSING

MIRIAM AMES, R. N.

Field Training for Health Services—The East Harlem Nursing and Health Service, through the generosity of the Milbank Memorial Fund, now offers educational experience and field training to qualified nurses and other workers in the health field.

A full-time supervisor of student activities will direct the field work of the students in coöperation with the general supervisors of the nursing staff and the special supervisors of nutrition work, health education, psychiatric social work, research and statistics.

An advisory committee on the educational program, appointed by and responsible to the Governing Board of the East Harlem Nursing and Health Service, has been named. The membership of the committee, which includes representatives from the fields of education nursing, medicine, nutrition, social work and statistics, gives assurance of the broad scope of the teaching program and promise of interesting developments in the correlation of allied services in the health field.

Application for field training or observation will be considered in the light of the candidate's past experience and future plans.

Teachers College is actively interested in the teaching program, and will participate through the Departments of Nursing Education and Nutrition.—East Harlem Nursing and Health Service, 354 East 116th Street, New York, N. Y.

The Nursing Shortage—The preliminary work of the Committee on the Grading of Nursing Schools has brought to light some interesting facts regarding

the alleged nursing shortage. In fact, it found the shortage to be non-existent: On the contrary, the evidence points to an over supply of nurses as far as gross numbers are concerned.

Whereas there were but 15 nursing schools in the United States in 1880, there were 2,155 in 1926, which added, and are adding yearly, 18,000 graduates to the nursing profession. Many of these drop out of professional life early, but at least half remain for eight or more years.

Old schools are growing, new schools are springing up, sickness is going from the home to the hospital, cases are shorter, people in the United States are in better physical condition than ever before. Yet, at the same time, there are many calls which go unanswered. In the face of these facts, what is in the future for the nurse?

Three solutions to the situation have been proffered. The first is that the nursing schools should exclude any applicant who does not give reasonable promise of becoming an ethical and competent nurse. The second is that the nursing profession, especially that part concerned with private duty nursing, endeavor to keep track of what its members are doing and to try to put each into the place for which she is best adapted. The third suggestion is that an effort be made to work out a more flexible nursing service with different degrees and qualities of nursing care at different costs for different periods of time. Such a service would need to acknowledge that all nurses are not of the same value and that cases vary in importance and difficulty. Assignments, hours, and pay should be adjusted to meet these facts.

A reorganization in private duty nursing along these lines, to be at all successful, needs the sympathetic and intelligent support of the medical profession.—May Ayres Burgess, Ph.D., *The Nursing Shortage*, *J. A. M. A.*, 90, 12: 899 (Mar. 24), 1928.

The Truth About Insulin—Dr. Hobart Rogers answers simply and graphically some of the questions which we hear repeatedly with regard to insulin.

1. Is Insulin a Cure? Insulin is not a cure in the sense that it will restore diabetics to perfect health, but its use can restore many diabetics to such a degree of health that they may dispense with its use.

Diabetes is a disease of assimilation in which sugars are not properly utilized but are allowed to accumulate in the blood and pass out, unused, in the urine. Insulin is a substance produced by the pancreas gland which is necessary for the proper assimilation of sugars. All of us have insulin all the time, produced within ourselves. A defective or diseased pancreas, which cannot produce insulin, causes diabetes. The treatment consists of giving the patient insulin extracted from the pancreas glands of cattle.

In many diabetics, the pancreas is not really destroyed but merely exhausted from overwork, and, if relieved of overstrain for a time, it may recover to such an extent that insulin treatment will be no longer necessary.

2. If One Begins its Use Must He Not Always Continue? "Any diabetic who is taking insulin may discontinue its use and return to the old methods any time he chooses." Some diabetics continue to need it while others prefer to take it because of the salutary effect it has upon them. Under insulin treatment, sufficient food may be eaten to enable diabetics to maintain their nor-

mal weight and do hard work; while without insulin so little food is allowed that they are thin, starved and melancholy, never able to do a day's work.

Diabetics who do not take insulin are always made very ill by colds, tonsillitis and pneumonia. The two most dreaded complications are diabetic coma and gangrene which often follow intercurrent diseases and sometimes end fatally. A diabetic properly treated with insulin is in no more danger of acute diseases than a normally healthy person.

3. Is not the Use of Insulin a Great Inconvenience? The treatment and the hypodermic injection once or twice a day are both inconveniences, but, if they are accepted as part of the day's routine, they can be made as commonplace as dressing, bathing or shaving.

4. Is There not Something Just as Good That Can Be Taken By Mouth? There is nothing as good as insulin. It is a purely physiological product with an absolutely harmless action. The preparation called synthalin can be taken by mouth, but its effects are feeble and it can be used only in the mildest cases. Furthermore, it is a drug.

CONCLUSION

Insulin is not a cure but a perfect means of control, capable of producing great improvement.

The benefits derived from its use greatly outweigh the inconvenience of administration.

No more conveniently administered substitute has yet been found.—Hobart Rogers, M.D. *The Truth About Insulin*, *Pacific Coast J. Nurs.*, XXIV, 4:204 (Apr.), 1928.

Nursing Situation Surveyed in Queens—How adequate is the supply of public health nurses in Queens? Under what auspices do they work and what is the scope of the work done by each?

The answers to these questions will be found in the report of the nursing situation in the Borough of Queens which was recently undertaken by the Welfare Council of New York City. The Committee, appointed by the Public Health Nursing Section of the council, has submitted its report to the Executive Committee of the council and prompt action is to be taken upon the recommendations.

Frederika Farley, chairman of the committee, states in the report that there is need of three times as many public health nurses as are now available in the borough. Ten times as many nurses are needed in the particular fields of infant welfare and tuberculosis. To provide for an adequate maternity service, Queens requires fifteen times as many nurses as it now has.

The scarcity of public health nurses would present a critical situation in the event of an epidemic, for in a borough of one million people there are only 131 nurses. Of these only 71 are available for the community at large. The report further states:

The critical nature of the situation is illustrated by the following facts, revealed in our survey: with 2363 known cases of tuberculosis in the borough, and 3544 "contacts" or other persons living with those having tuberculosis, as well as for all other communicable diseases, there are only 24 where at least 60 are needed; in the field of infant's health 6 nurses are on duty and 60 are needed; in the maternity field, in this borough which had 12,925 births last year, 2 public health nurses are available

where 30 are needed; in the schools of Queens with 149,000 pupils, 27 nurses are on duty and 68 are needed; in the field of bedside care 47 nurses are available and 182 are needed.

The committee found that no instruction in "Home Hygiene and Care of the Sick" is being given in Queens except by 4 nurses of the Department of Education in 4 high schools.

RECOMMENDATIONS MADE

The report of the Public Health Nursing Survey Committee makes the following recommendations:

The Committee suggests that inasmuch as all the nursing organizations in Queens, except 3, are working on a borough basis, that the nursing work be organized as a borough activity rather than a community activity.

That the Red Cross Chapters promote classes in "Home Hygiene and Care of the Sick."

That, if possible, the public health nursing work in Queens Borough be developed as a generalized program rather than a specialized program, but if this is not feasible to begin with:

That the first additional nurses be assigned to duty in the bedside group putting special emphasis on the necessity of increasing the complete maternity service;

That additional nurses be added to the other groups as rapidly as possible, and that, as soon as practicable, there be one nurse director for the public health nursing work in the Borough;

That this report be submitted to the Welfare Council by the Public Health Nurses Section with the recommendation that the Welfare Council present the report to the public-spirited people of Queens Borough;

That the Welfare Council appoint a committee of interested people of the borough to promote plans whereby this increased nursing service may be developed as soon as possible.

Long Skirts at an Annual Meeting

—In the 30th annual meeting of the Victorian Order of Nurses for Canada, Montreal Local Association, there was featured a

. . . five-minute scene depicting the nursing visit 30 years ago, and one depicting the nursing visit today, which struck a new note in annual meetings for Montreal. The voluminous skirts of the gay 90's, the lack of social organization with a consequent lack of coöperation, the

old-fashioned cradle continually rocking, were in striking contrast to our short-skirted brisk nurse of today, with all sorts of social organizations ready to help her, no cradle but a crib for baby, and occupational therapy for grandma who used to sit huddled in a chair all day with folded hands gradually becoming stiffened. The scenes were short, and the dialogue very much to the point, with enough humor to embellish it.—

Genevieve L. Hurd, Executive Secretary.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

New York Studies Its Health Education Material—The readers of this department will be interested in knowing that a study of the variety and extent of the use of various materials and methods in health education by a selected group of agencies is under way in New York City. Later we hope to be free to announce the publication of a report on this study which is being made by Janet Jarrett representing the Research Bureau of the Welfare Council of which Neva R. Deardorff is director.

Give Them a Chance—Give the actual publicity workers in your organization a chance to get ideas and inspiration from attendance at the Annual Meeting in Chicago next October. No one is so skillful and resourceful in the spreading of health information that he will not gain greatly from attendance at the Chicago meeting. Nothing can take the place of personal contacts and conferences with workers in the same field. Better to cut down the expenditure for printed matter or other publicity and education budget items than to have your actual publicity worker stay at home.

"No—But—"—Here is what Prof. Harry A. Overstreet said at a recent luncheon of the New York Committee on Publicity Methods about a cancer folder: "'Have You a Cancer?' it asks in large black type all over the first page. I don't like the idea—'No!' I retort mentally, and toss the folder into the waste basket. But my wife picks it up and looks inside. 'But this is interesting!'

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

she commented, 'I didn't know cancer had symptoms, and—see, there is a cancer age!' Now the outside of that folder was not interesting. It got the 'No!' response, which is fatal to appeal literature. But the inside was positively exciting. If the writer had raised a different kind of question on his front page, if he had asked, 'Do You Know the Symptoms of Cancer?' he would have drawn from me the 'No—but . . . ' response which would have carried me over into the substance of the appeal. Don't forget that the 'No' response is fatal to interest, the 'No—but . . . ' response is stimulating to interest. But no interest will survive a long and labored introduction. Get on with it—don't spend so much time getting ready."—*Better Times*, 151 Fifth Ave., New York N. Y. Jan. 2, 1928.

Interest! Instruction!! Action!!!
—The three-fold job of the health educator or propagandist:

(a) The interest of those to be instructed must be borne in mind; their attention must be arrested, desire must be created, and self-regard must be stimulated. A commercial advertiser studies the psychology of the crowd and seeks to touch the elemental instincts of the individual. His aim is to amuse, or to give pleasure, or to instill fear into the mind of his client. He visualizes for him something which he has not hitherto seen, or calls out into exercise such imaginative faculty as he possesses. We can all think of advertisements which stick in the memory because the advertiser, understanding our psychology, has impressed upon us something which we cannot forget, even if we would.

(b) Having thus aroused interest, the propagandist must fix or anchor it by instruction, by providing a body of knowledge, concrete, correct and timely, attractively presented in very varied form, appealing to both eye and ear.

(c) Finally, also like the good advertiser, he must get action. The advertiser wants people to buy his wares: the propagandist wants to obtain from his clients assent to his advice, a practice and a mode of life.—

Public Education in Health. "A Memorandum addressed to the Minister of Health." 1926. British Library of Information, 44 Whitehall St., New York,

EDUCATIONAL MATERIAL

The revised series of pamphlets and other publications of the American Heart Association, in course of preparation, have been classified as follows: (a) those for the workers, including physicians, nurses, secretaries and others; (b) those for the patients and their families; and (c) those for the general public.

Health—Diseases, Drugs and Sanitation. List of publications relating to these subjects. Revised. Superintendent of Documents, Washington. Price List 51. *Free.* New editions mailed as issued—if requested.

Safeguarding Your Health from Tuberculosis. Department of Health, New Haven, Conn. Well done 24-page pamphlet explaining to citizens "How New Haven Cares for Tuberculosis" through public and private agencies. A form of reporting the work being done.

The 50 million dollar welfare bond issue to be voted on in Pennsylvania in November is responsible for four 6-page folders issued by the Pennsylvania Mental Hygiene Committee of the Public Charities Association, 311 South Juniper St., Philadelphia, Pa. The copy is good, and the form is a good example of the better grade of quite inexpensive folder for widespread use. Of course the type should be larger, but the leading makes it quite readable. Each of the series is on a different color of paper. The titles are: *Salvaging the Feeble-minded, Handicaps of Epilepsy, Why So Many Go Insane, Do You Know?* Samples *free.*

A handy manual of 16 pages, *Health*

for the Family, tells the residents of Bellevue-Yorkville district, New York City, of the clinics and services available. Page by page a type of clinic or service is described, with days and hours. Very well done—except that the map might better have been an inch wider to gain in clearness and usability. Address Bellevue-Yorkville Health Demonstration, 325 East 38th St., New York, N. Y. *Free.*

An educational campaign against rickets conducted by Mulberry Health Center, 256 Mott Street, New York, N. Y., produced a series of exceptionally good 1-page leaflets, an 8-page pamphlet, and four posters (one of which is not so good). A sample set for \$1.50; set of leaflets, 10 cents; posters, 40 cents each. Special rates for quantities. Ask for Plans for a Campaign Against Rickets. See reproductions in *Trained Nurse*. January, 1928. A brief account of the campaign in *Public Health Nurse*, March, 1928.

Groceries as Nutrition Educators—Going out after the coöperation of a particular group is well illustrated in the grocery store window project of the Syracuse Department of Health and Syracuse Health Demonstration. In an elaboration of the following paragraph at a meeting of the Committee on Publicity Methods at Memphis, Miss Bache brought out how by enlisting a few stores an object lesson was provided to use in getting more of them to coöperate. At one stage of the effort in Syracuse the canvass of stores was developed by districts where the cumulative effect was good both upon the storekeepers and the public.

Syracuse has been using for the past year its grocery store windows to give out nutrition lessons. Each week ten grocery stores had a new display in which health and nutrition played the leading rôle. To make the exhibits attractive, painted beaver board figures were used illustrating the subject under discussion. At the same time the exhibit was displayed in

the window, the grocers gave out printed sheets bearing the nutrition lesson outlined by the Department of Health. Some of the subjects chosen for window displays and nutrition lessons were The Child's School Lunch, Food for the Working Man, What Should Go in the Housekeeper's Market Basket? Dairy Products which make for Health, and Vegetables on the Family Dining Table. The large grocers who did some advertising saw the advantage of the exhibits at once, but the small corner grocery storekeepers had to be won. It was with them that perhaps our greatest victory lay, for many of them became sold to educational advertising and much helpful information was gotten over not only to the consumer, but the merchant.—

Louise Franklin Bache.

SCHOOLS AND CHILDREN

How it came about that in Athens, Ga., the children "who needed to have teeth filled, pulled or cleaned, actually had them filled or pulled or cleaned," is told in A Plan with Teeth in It, by Slaughter and Smith. *Hygeia*. Dec., 1927. A reprint free from Child Health Demonstration Committee, 370 Seventh Ave., New York, N. Y.

Health in Drama, Verse and Song. Tuberculosis Society of Detroit, 51 Warren Avenue West, Detroit, Mich. For teachers. Out of print but will be reprinted if enough orders are received at 25 cents a copy.

Jack O'Health and Peg O'Joy by Herben (primary grades), and Most Wonderful House in the World by Haviland (middle grades) are recommended in Books for the Rural Schools in the Southern mountains, by *Mountain Life and Work*, Berea, Ky.

The Jolly Jester, by Harvey W. Wiley. *Good Housekeeping*. Jan., 1928. "Here is a clown spreading the gospel of good health most convincingly."

May Day suggestions for the whole community are given in A Festival Book of May Day—Child Health Day. 1928. 80 pages. Illustrated. American Child Health Association, 370 Seventh Ave., New York, N. Y. 10 cents. The May Day plans may be adapted to "Play

Day" at a later date in communities where May Day was not observed.

Long Life to Your Children's Teeth (18 pages); The School Lunch (32 pages). Educational Department, Postum Company, Battle Creek, Mich. Free.

TITLES

False Dentists and False Teeth—*Hygeia*.

The Old "Spring Tonic" That Stood on the Shelf—Oregon State Board of Health.

Don't Buy Spectacles and Tinware Together—*Northwestern Health Journal*. April, 1928.

Slenderizing—New York State Department of Health. News release and radio talk.

The Sneeze Versus the Job.—Woman's Bureau, Washington. Press release 621. Paragraph on "common colds."

The lost 16,000—*Child Health Bulletin*. March, 1928. "The loss each year of about 16,000 mothers in childbirth."

Thousands of Hunters Trail Deadly Tuberculosis Germ—*Northwestern Health Journal*. April, 1928.

Are You Digging Your Grave with Your Fork?—Title of a pellagra folder by Health Conservation Department, Pilot Life Insurance Company, Greensboro, N. C.

This Is No April Fool!—A folder on smallpox distributed by the local gas and electric company. Prepared by Racine Board of Health.

The Road to Happy Motherhood—Milwaukee Health Department. 40 pages. Excellent "mother book." Not simple enough for some groups.

Slender Youth—a Pilot Life Insurance Company (Greensboro, N. C.) folder. Some of the sub-titles: Youthful Lightweights Are Bad Risks, Fashion-Plate Girls May Be Walking Sanitarium Ads, A Big Breakfast Starts the Day Right.

LAW AND LEGISLATION

JAMES A. TOBEY, LL. B., DR. P. H.

Triumph Deferred—Eight measures which had been adopted by Congress and presumably represented the will of the people were vetoed by President Coolidge about the middle of May, 1928. One of these was the Parker Bill for federal health coördination; another was a bill allowing retirement privileges under certain conditions to emergency officers of the World War, including many medical officers.

Congress showed its regard for the Presidential disapprovals by promptly repassing by overwhelming majorities three of the vetoed measures, including the emergency officers' bill. Unfortunately, no action was taken again on the Parker Bill before adjournment of the session.

The reasons given by the President for his strange action in vetoing the Parker Bill were that it tended to "militarize" the U. S. Public Health Service and that one part of it was unconstitutional. To support this latter contention he quoted from an opinion of the Attorney General to the effect that the bill limits the choice of presidential appointees to persons who pass an examination conducted by a board convened by the Surgeon General and also limits the choice to persons who are recommended by the board and the Surgeon General. The Attorney General seems to think that such action vests in the Surgeon General improper participation in the executive functions of the government.

With regard to the U. S. Public Health Service as a military organization, the U. S. Court of Claims held on April 30, 1928, in the case of Rupert Blue v. U. S. that it is not a military

body. In that case former Surgeon General Blue was denied exemption in his income tax claimed for the years 1918 to 1920 on the ground that the U. S. Public Health Service was part of the military forces. The Parker Bill does not cause any further militarization of the U. S. Public Health Service, but simply provides that sanitary engineers and certain other scientists be given a commissioned status similar to that of the medical officers. This provision has always been ardently opposed by H. M. Lord, Director of the Bureau of the Budget, one of the President's close advisers.

The article of the Constitution which the Attorney General seems to think is contravened by the Parker Bill states (Section 2), ". . . the Congress may by Law vest the Appointment of such inferior officers, as they think proper, in the President alone, in the Courts of Law, or in the Heads of Departments." It is pretty far fetched to say that the Parker Bill is invalid under this clause, inasmuch as the system approved by law in 1889 (25 Stat. L. 639) and never held invalid is merely extended to cover additional personnel.

In concluding his message on this matter the President stated, "The other provisions of the bill have my entire approval, and if the unconstitutional feature should be removed and the militarization feature should be removed I should be pleased to approve it." What needs to be removed is the baneful influence of the Director of the Budget. He and Senator Smoot seem to be having the last laugh, but triumph for public health is only postponed, not prevented.

Congress Adjourns—The First Session of the Seventieth Congress adjourned on May 29, 1928, after making a better record from the standpoint of public health legislation than has been the case for some years.

In addition to passing the Parker Bill, Congress adopted a public resolution designating May Day as Child Health Day. In passing the new revenue measure, Congress voted not to increase the tax from \$1 to \$3 on physicians who dispense narcotics, in spite of vicious attacks made on the medical profession by Senator Smoot. Provision for deduction on the income tax report of traveling expenses for attending professional meetings was adopted by the Senate in considering this bill, but did not survive in conference.

Progress was made on a number of other public health measures. Thus, the Ransdell bill (now S. 4518) for a national institute of health was reported in the Senate. Copies of the hearings on this measure are now available and may be obtained from the Senate Committee on Commerce. A bill for the investigation of cancer (S. 3554) passed the Senate on May 18, as did also a bill (S. 3936) to regulate the practice of the healing art in the District of Columbia, on May 29. A similar bill (H. R. 12947) has been reported in the House.

The bill to establish two federal narcotic farms (H. R. 13645) passed the House on May 21, while the measure to amend the definition of oleomargarine (H. R. 10958) was reported on May 11. A bill (H. R. 11981) relative to service of officers of the Medical Corps passed both branches of Congress, in spite of the customary comments by Senator Smoot. A bill to regulate the sending of poisons through the mails (S. 3127) also passed the Senate, on May 10.

In connection with medical matters, there is a new veterans' hospitalization law, carrying an appropriation of \$15,-

000,000. Another new law extends medical and hospital relief to retired officers and enlisted men of the Coast Guard. Congress voted the pay and allowances of a colonel to the major who now serves as the President's physician.

New Bills in Congress—Among the nearly 20,000 bills introduced so far in the 70th Congress are a number of other new ones of interest to sanitarians. These include: H.R. 13902 for examinations for the criminally insane; S.4463 for a children's tuberculosis sanatorium in the District of Columbia; H. J. Res. 309 calling upon the President to issue a proclamation every year designating the first week in May as national health week; H.R. 13854 to provide facilities for emergency medical care at the Capitol; and S.4478, to prohibit use of public funds for purchase of butter substitutes for government wards.

All of these measures and a few others pertaining to public health, as previously reported in this department, will be before the second session of the 70th Congress when it convenes next December.

Erudition in the Appendices—The body and appendices of the May numbers of that preceptive magazine, the *Congressional Record*, have some of the aspects of a textbook on public health, for they contain the following didactic articles: Poison in Denatured Alcohol and Modern Views Concerning the Use of Alcohol, by Representative William I. Sirovitch, May 16 (page 9267); Cancer-Humanity's Most Deadly Scourge, by Senator Neely, May 18 (page 9393); Prevention and Cure of Tuberculosis, by Dr. J. Morrison, May 23; Noguchi, by Representative Sirovitch, May 24 (page 10005); Filibuster and Health, by Senator R. S. Copeland, May 26 (page 10412); Federal

Maternity and Infancy Act, by the League of Women Voters, May 29 (page 10703).

Federal Narcotic Act Sustained—The constitutionality of the Harrison Anti-Narcotic Act of 1914, as amended in 1918, was sustained by the U. S. Supreme Court in the decision of *Nigro v. U.S.*, handed down on April 9, 1928. The case had gone to the Supreme Court by certificate of the Circuit Court of Appeals of the Eighth Circuit, with a request for answers to four questions. The Supreme Court answered only the first and second, which dealt with the meaning and scope of the word "person" in the first sentence of section 2 of the law, and with the general constitutionality of the act.

The second section of the Harrison law makes it unlawful for any person to sell, barter, exchange, or give away narcotics except in pursuance of a written order on a form issued by the Commissioner of Internal Revenue. In this case *Nigro* unlawfully sold morphine without such written order. The question was whether the words "any person" in the section were limited to those persons who are required to register and pay the tax. The answer of the Supreme Court was "No."

The law was upheld as a valid taxing measure, designed primarily for the purpose of raising revenue. The Court points out that merely calling a law a tax measure does not necessarily make it so, and cites the Child Labor Tax Act, which was held to be unconstitutional. The tax under the antinarcotic act amounts to about a million dollars a year, which is a substantial sum and a real source of revenue to the federal government.

England Has Its Troubles—American health officials are not the only ones who are sometimes unable to secure re-

ports of tuberculosis on time. According to a note in the *Lancet* for May 19, 1928, complaint has been made by the Medical Health Officer of Carlisle that physicians delay in notifying of cases of tuberculosis. There was considerable debate by the health committee as to whether to prosecute or not and it was finally decided to send another warning.

Miscellaneous items—The national narcotic drug situation today is outlined by L. G. Nutt, U. S. Deputy Commissioner of Narcotic Prohibition, in *Pennsylvania's Health* for May-June, 1928.

The White Slave Traffic Act can be violated by transportation in a privately owned automobile, according to *Holden v. U. S.* 23 Fed. R. (2d), 678.

More than a million animals were given the tuberculin test in the United States during March, 1928, according to the U. S. Bureau of Animal Industry. The number of reactors was 27,999. The number of cattle in accredited herds is over 2,000,000, and 20,500,000 more are under supervision.

The question has been asked as to what supervision is exercised by states over professional blood donors. If any reader can answer this, enlightenment would be appreciated by the Associate Editor.

"The Law Says"—All persons are presumed to know the law, but the written law is so extensive these days that it eludes even the lawyers, though they have the advantage of knowing where to look for it. In the *Commonwealth* of the Massachusetts Department of Health for Jan.-Feb.-March, 1928, Merrill E. Champion, M.D., contributes a short article about the laws in that state which apply to public health. This is useful information for local health officials as well as for laymen, and the type of thing which could appear to advantage in many state health bulletins.

BOOKS AND REPORTS

Health and Wealth—*A Survey of the Economics of World Health*—By Louis I. Dublin, Ph.D. Statistician, The Metropolitan Life Insurance Company, New York, N. Y. New York: Harper, 1928. 361 pp. Price, \$3.00.

This book is a collection of essays which have been given by the author during the past few years. Although they consider a number of different subjects, they cover phases of public health which are necessary for clear understanding of public welfare and the practical application of our knowledge. They treat largely of vital statistics, a subject on which too many health officers and physicians are deficient, and show how such knowledge can be applied in carrying out better programs. The lesson that life and health are our greatest possessions is stressed, and while it is recognized that a value cannot be put upon life solely in terms of dollars and cents, it is clearly shown that the rearing and education of a child costs money, and that the early death of an educated citizen is a financial loss to the community. Such facts are useful to all who are concerned in public health work, and especially to those who must deal with legislative bodies, to whom the economic side of health must be demonstrated.

Any country with a low standard of health is a menace to its neighbors, especially in these days of rapid transit, and international health service is one of the foremost factors in creating an understanding between nations and cementing friendship. "For none of us liveth to himself, and no man dieth to himself."

A strong plea is made for more liberal expenditures in health work. As far as children go, the loss from illness is more than the amount which good care would

cost, and from death the loss is more than ten times as great.

It is difficult to say which of these essays is most important. We must call attention to the one on heart disease, since at present it is far in the lead of all other diseases as a cause of death, while tuberculosis, which was called only a short time ago "Captain of the Men of Death" has dropped into the fifth place.

Another particularly interesting and timely essay is on "Birth Control and the Population Question." The author shows that our annual increase is only about half of what has been generally claimed and holds that all forecasts must be revised in view of our declining fecundity. We are very near the danger line of a stationary population. In view of this, the widespread propaganda for birth control is out of place, especially since it is universally practiced among those who are best fitted to become the parents of future generations. A dig is taken at the "Nordic Myth," the author holding that when the upper and lower 10 per cent of our population are eliminated, there is little indication of marked differences in ability among the intermediate 80 per cent who form the bulk of our plain folk carrying on the work of the world.

In close relation to this topic is the changed status of women, which is considered a "major revolution in the history of the world." In 1920, more than 8½ million women were gainfully employed, less than 2 million of whom were married. Of a million professional women less than 125,000 were married, and experience has shown that the greater number of them will remain single.

We wish space permitted a longer review of this unusually helpful book.

The author has the faculty of making figures interesting even to those who lack talent in this respect. He holds a position which brings him into constant contact with the problems which he discusses. For life insurance companies a correct knowledge of such subjects is essential to success. We know of no one who has taken better advantage of his opportunities than the author. He has given us a book with which every health officer, health worker, and statesman should be familiar, and which will interest all who are concerned in the welfare of humanity and the future of the race.

The make-up of the book is beyond criticism, the paper is light, yellow tinted, with a mat surface, and the print clear.

M. P. RAVENEL

Why Men Fail. Edited by Morris Fishbein, M.D. and William A. White, M.D. New York: Century Co., 1928. 344 pp. Price, \$2.00.

Why Men Fail is a book of 344 pages containing 13 chapters on such subjects, as Parents of Failures, The First Job, Sex Has Thrown a Bomb Into Business, Wives Who Help Their Husbands to Fail, "Queer" Failures, Day-Dreamers and Bluffers, Beating Handicaps, Handicap-or Alibi, Fear, Why Women Fail, Job Misfits, and Home-Made Failures.

The title of the book is accurate, but from the sales viewpoint unfortunate. The surreptitious buyer will not want his friends to suspect him of a personal reason for needing it. Many outwardly successful men are inwardly conscious of failure.

As the complexities of life increase so do the chances for failure, because our individual mental machinery cannot carry the additional load required for success. "Of all the beds in all the hospitals throughout the United States," says Dr. William A. White in the introduction, "one in every two is for mental

disease; in other words, there are as many beds for mental ailments as for all other ailments put together." This does not include the large number with minor mental defects who somehow manage, though inefficiently, to carry on.

This book is the result of a conference in Cincinnati, O., on why men fail. It was attended by the leading psychiatrists of the country. Many of us are unaware of malfunctioning relationships, or, if aware, where to begin tightening up the machinery. Also, most of us have rather confused ideas about what a psychiatrist is and does. In a word, he is an unraveler of hidden causes who then helps to reconstruct maladjusted persons. The reading of this book establishes increased confidence in the existence of practicable solutions to problems of failure.

In speaking about melancholia one of the authors, Dr. Karl A. Menninger says: ". . . Few realize that murder is of much less frequent occurrence than suicide. Moreover, the victims of suicide are, generally speaking, far more desirable members of society than the victims of murder."

One does get the impression that most of the roads on which society's misfits travel, if pursued sufficiently far, lead to the psychiatrist's door. But what if they do? It's no disgrace to be mentally sick. And without an understanding guide, this road might have a more unhappy ending.

W. W. PETER

Physiology—By V. H. Mottram, Professor of Physiology in the University of London. New York: W. W. Norton & Co., 1928. 279 pp. Price, \$3.00.

Many years of teaching physiology convinced the author that the average student was overwhelmed by the size of textbooks, and their apparent lack of beaten tracks brought discouragement. He determined on a plan which would give the beginning student a bird's-eye

view of the boundaries and important features as a preliminary to future study. After making a sketch plan of the foundational material, he was induced to add the most recent views of physiologists in simple and untechnical language. The present book, therefore, has been designed as an introduction to the study of physiology, not only for medical students, but for all others requiring a general knowledge of the subject. Indeed, the book is so written that any well educated person can understand it.

The author takes as a sort of text the question "How Does the Human Body Work?" The first chapter gives a survey of the field of physiology, and ends with the statement: "The result of countless years of evolution is an organization which works on common sense principles." Successive chapters are devoted to the various parts of the body and explain their functions. It seems to us that the nervous system is very properly considered first, on the ground that the "... nerves bear the brunt of modern civilization and a healthy nervous system is more important in daily life almost than any other part of the body."

In closing the author modestly says that he has given only the slightest sketch of the realm of physiology, and advises the study of more complete books. While we have no desire to dispute what he says, we must express the opinion that anyone who reads this work understandingly will have a very clear idea of the subject, and only those who are intending to specialize in teaching or research, need go any further.

The book is well printed on light paper with a mat surface. It is well illustrated in black and white. Within the field selected, we know of no book which can be more safely recommended. The author has evidently read widely, and relieves the tedium of difficult study by many interesting references, in addition

to which he has a terse way of impressing facts upon the reader.

M. P. RAVENEL

The Mental Health of the Child—
By Douglas A. Thom, M.D. Cambridge: Harvard University Press, 1928. 46 pp. Price, \$1.00.

In this little book, Dr. Thom has discussed in very simple terms some of the important factors to be considered in developing and preserving the mental health of the child. In these pages he discusses the modern attitude toward mental health, showing the very important part that the early life of the child plays in the later adjustment of the human being. The relation of adults, particularly parents, to the problems which come up in the life of the child are particularly stressed, and two case stories are given to illustrate their relation to the development of some such common problems as temper tantrums, masturbation, and so forth. Throughout this little book, emphasis is continually laid on the fact that behavior is the resultant of many relationships and situations affecting the life of the child, and that the understanding of his behavior means the understanding of motives and of these basic things. He particularly stresses the point that a child must gradually develop his own independence and free himself from the dependency situation which is normal in infancy and which is gradually lessened in the normal course of growth and development.

FREDERICK H. ALLEN

Clinical and Abnormal Psychology
—By J. E. Wallace Wallin, Ph.D.
Boston: Houghton Mifflin, 1927.
xvii, + 649 pp. Price, \$3.00.

The study of the individual, his original endowment, his problems, relation to environment, reactions and ability to adapt are assuming an ever-increasing importance. As a result the clinical psychologist is now with us; his avowed

function is the scientific study of these factors. To correlate and delimit the field and to make the subject accessible to students, educators, social workers and others interested in abnormal behaviour problems, are the objects of this book.

There is a short introduction to the subject and definition of what the author means by clinical psychology. He then proceeds systematically and didactically, in the pro and con method, to deal with its various aspects.

The second part of the book deals with the general level of intelligence, and specific intellectual abilities and disabilities. There is a concise historical and critical survey of the development of the various psychometric procedures, with special reference to the Binet-Simon group. The psychology of the special senses, with illustrative cases, is clearly discussed. Memory, attention, associational processes, normal and pathological, are fully treated from the theoretical and experimental viewpoints.

The author gives a brief outline of some of the psychoses and succeeds in familiarizing the reader with symptomatology. Psychoanalysis receives the usual summary and almost complete rejection, by this author, on at least seven counts.

Neuropsychiatrists, if they read this book, might perhaps disagree with several phases of it. The elusive difference, according to the author, between the clinical psychologist and the psychiatrist, gives to the latter quite different proportions. One does not feel inclined to believe that Dr. Wallin's outline of requirements are quite sufficient to enable one to make clinical diagnoses, even though he does advise "a minimum amount of medical work including physical diagnosis [*sic*], pediatrics, nose, throat, eye and ear disorders, orthopedics, mental deficiency from the physical standpoint and neurology (particularly

the nervous and mental disorders of childhood)." Truly a large order even—"if the student begins to specialize in his senior year at college . . ." Fundamentally the idea embodied in this "mushroom specialist" concept is absurd. One does not acquire medical training by the "course" method. A clinical diagnosis involving the special knowledge of the possible physical factors involved should only be made by a qualified physician.

One or two, perhaps minor details, are noteworthy and illuminating: The footnote on page 316, ". . . upon development of the frontal lobes of the cortex (the layers of gray matter covering the *cerebrum and cerebellum*)" [*Italics reviewer's*]; the sentence on page 443, "When there is an excessive secretion of sugar (*glycosuria*) the excess supply passes into the urine and blood . . ."

Where the author deals with his own subject and within his special field he is clear, concise, critical and worth reading. The bibliography is valuable.

M. RALPH KAUFMAN

Laboratory Manual for the Detection of Poisons and Powerful Drugs—By Dr. Wilhelm Autenrieth, authorized translation by William H. Warren, Ph.D., Philadelphia: Blakiston, 1928. 698 pp. Price, \$6.00.

This is the 6th American edition translated from the 5th German edition, which has been completely revised and provided with extensive additions. Dr. Autenrieth's book is so complete that it almost defies adequate reviewing.

The volume treats of those substances which distill at boiling temperatures from acid aqueous solutions, and considers these in the first group. Those members which are non-volatile under these conditions, such as salicylic acid, caffeine, etc., are considered in the second group. All those metallic poisons constitute a third group. The fourth

group concerns itself with the materials not considered in any one of the three previous groupings. A chapter is devoted to apparatus and special methods of examination, and the closing chapter is devoted to quantitative estimation of certain alkaloids and other principles in crude materials. This edition has a supplement devoted to the preparation of reagents and the detection of blood stains and human blood. And lastly, an appendix in which the narcosis theory of Meyer and Overton is discussed, along with certain other special subjects relating to alkaloids.

A colorimetric method for the estimation of minute quantities of hydrogen sulphide in water and air is described.

This volume should continue to hold its high place in the laboratory devoted to the detection of poisons and drugs in the animal body.

LEONARD GREENBURG

Handbook for the Medical Soldier—

By Major A. D. Tuttle, Medical Corps, U. S. Army, New York: William Wood, 1927, 691 pp. Price, \$5.00.

The need in the new and changed post-war Army for a comprehensive manual for the Medical Departments of the Regular Army, the National Guard, and the Organized Reserves has now been filled. This handbook has been carefully prepared and abounds in information for the medical soldier and for others interested in medical and sanitary problems of the Army. It contains a foreword by Surgeon General Ireland. Basic technical subjects, such as first aid, elementary anatomy and physiology, materia medica and pharmacy, nursing, hygiene and sanitation, mess management, foods, minor surgery, clerical work, and the care and operation of motor vehicles are given in some detail. An enormous amount of valuable material has been assembled in a relatively small space. The book is clearly written, contains 24 chapters, 180

illustrations, and has a flexible binding.

While it is designed primarily for the enlisted man, this manual should prove invaluable for medical officers and nurses, as well as for others interested in national preparedness.

IRA V. HISCOCK

Max von Pettenkofer. His Theory of the Etiology of Cholera, Typhoid Fever and Other Intestinal Diseases—A Review of His Arguments and Evidence—By Edgar Erskine Hume, M.D., Dr. P.H., LL.D., Major, Medical Corps, U. S. A. New York: Hoeber, 1927. 142 pp. Price, \$1.50.

Major Hume has performed a real service in making available for the first time a biography of Pettenkofer, the German scientist who was one of the first great epidemiologists. This little book is more than a biography, however, for only about one-third is devoted to the events of Pettenkofer's life. The remainder of the text considers in an interesting manner the work of Pettenkofer on cholera and typhoid, and his deductions and theories concerning the nature of the spread of these and other intestinal diseases. A bibliography of 227 publications by this early sanitarian, together with 57 references to articles about Pettenkofer, completes the book. There is no index.

The modern sanitarian, for all his progress, can derive much of benefit from the example of his predecessors. As Hume points out, Pettenkofer was often wrong, according to present knowledge, but he was a versatile scientist who made great contributions to chemistry, physiology, and public health. The life of any man who could clean up a city as Pettenkofer did Munich, and reduce its typhoid death rate to a comparatively negligible quantity, is worth knowing about. The sanitarian can, therefore, read Major Hume's book with profit.

JAMES A. TONEY

The Essen Number—*Report of the convention of the Association for Water, Earth and Air Hygiene held in Essen in June, 1927. Published by and obtainable through the Landesanstalt für Wasser-Boden-und Lufthygiene, Berlin-Dahlem, Eherenbergstr. 38-42. 1927. 518 pp., 288 ill. Price, 12 R. M.*

This volume contains the proceedings of the twenty-fifth annual convention of the Association for Water, Earth and Air Hygiene held in Essen in June, 1927 (first convention outside the city of Berlin). The location of Essen in the Ruhr Valley in the heart of a thickly populated industrial section offered exceptional attractions for such a convention.

At the same time as the convention there was an exposition ("Achema") of chemical apparatus held in Essen under the auspices of the Division for Water Chemistry of the Association of German Chemists (Vereins Deutscher Chemiker). Part 9, pages 439-494, of the volume is given over to a description, profusely illustrated, of the apparatus exhibited at this exposition.

The papers covered the entire field of sanitary science from the engineering phases of water supply and waste treatment, the effects of air pollution on human population and vegetation, to the disinfection of clothing and the control of vermin. The following is a list of the papers presented at this convention:

Water and Sewage in the Rhine-Westfall Industrial Area, especially, with Reference to the Emscher- and Lippe Association, by H. Helbig

Sewage Treatment Works of the Emsch Association, by M. Prüss.

The Disposal of Settled Sludge from a Chemical Standpoint, by H. Bach

The Work of Ruhrverband, by Dr. K. Imhoff.

River Clarification and Power Installation at Hengstey, by O. Spetzler

Biological and Chemical Sewage Purification with the Aid of Air, by Dr. F. Sierp

The Left Lower Rhine Drainage Board in Moers Niederrhein, by K. Fehring

The Ruhr Valley Reservoirs, the Möhne and Sorpe Reservoirs, by E. Link

The Water Supply of the Ruhr Coal District from the Hygienic Standpoint, by H. Bruns

The Water Supply of the City of Essen, by B. Nerreter

Permutit Water Purification with a Special Reference to the Circulatory Regeneration System of Hufschmidt, by K. Hofer

Air Hygiene, by E. Wernicke

Vegetation and Poisonous Gas, especially Sulfur Dioxide, by E. Tiegs

Chemical Questions of Air Hygiene, by W. Liesegang

Air and Dust Investigation of the Rhine-Westfall Industrial Area, by H. Reisener

Air Pollution and Prevention, by L. Diesfeld

Question of Health Hazard of Factory Air, by F. Müller-Voigt

Communal Hygiene Questions in the Field of Vermin Control, by J. Wilhelmi

Description of Apparatus Exhibited at the Chemical Exposition ("Achema"), by H. Bach

The subjects are all clearly and authoritatively treated, and profusely illustrated. The volume furnishes an exceedingly valuable summary of current practice in the field of sanitation. The questions are naturally discussed from the standpoint of applications to German conditions but references are frequently made to recent progress in other countries. Of the 350 delegates to this convention a considerable number came from foreign countries.

A. W. BUSHWELL

The Present Status of Preschool Hygiene in the United States—

By Frances M. Hollingshead, M.D., Director, Buffalo Foundation, Buffalo, N. Y. 40 pp.

This monograph is one of the most comprehensive résumés prepared recently on preschool hygiene and represents careful research work. The monograph was originally presented as a paper before the Child Hygiene Section of the American Public Health Association at the 56th Annual Meeting at Cincinnati, O., October, 1927. This monograph of 40 pages has been put out in attractive form. Copies of it are available from the Buffalo Foundation, 714 Marine Trust Bldg., Buffalo, N. Y. A. B. T.

That Mind of Yours. A Psychological Analysis—By Daniel B. Leary, Ph.D. Philadelphia: Lippincott, 1927. 266 pp. Price \$1.75.

This book is the outcome of a series of articles which have been running in the *Buffalo Evening News* for four years. The author describes it as "the story of modern psychology," and he professes to explain what psychology is, its problems and their solutions, as the modern psychologist sees them. He holds that there are real standards, but in the past we have gone from sandhill to sandhill, and only now have we discovered real solid foundations on which to build. This shows the optimistic vein in which the book is written.

Further on he acknowledges that there are many definitions of psychology, a number of which he gives and discusses. His first and simplest definition is that it is "a point of view," "a way of looking at human beings and their conduct." To those who have followed the reviews of a number of books on the subject during the past year, this is illuminating. The fact of the matter seems to be that psychologists themselves are not agreed on a definition, and have divergent views as to fundamentals. There are almost as many definitions as there are books on the subject.

The author is not a physician. He acknowledges, however, that many physicians have made notable contributions to the science, though they have not been students of psychology. On the other hand, he confesses to an opinion, which we believe the average physician arrived at many years ago, "that many so-called psychologists, particularly those of the inspirational school and the optimistic uplift Pollyanna persuasion, know little or nothing of biology and medicine."

The reviewer makes no pretense at being a psychologist in spite of the fact that an earnest effort has been made to understand what that profession is driv-

ing at. Some members have made real advances.

It must be remembered that this book is written for the laity, and we believe it to be better than the average of its class.

M. P. RAVENEL

Fundamentals of Dairy Science—

By Associates of Lore A. Rogers in the Research Laboratories of the Bureau of Dairy Industry, U. S. Department of Agriculture. New York: Chemical Catalog Company, 1928. 543 pp. Price, \$5.50.

The accumulated wisdom of the ages with respect to the biology, chemistry, bacteriology, and general scientific aspects of milk and milk products has been assembled in this notable volume, to which numerous experts have contributed. Nearly everything now known and understood about this most important of the foods of man seems to be presented here in a thorough, accurate, and at times extremely technical manner. It is stated in the preface that the book is designed for advanced students and research workers in the field of dairy science. As a consequence, parts of it are far from popular in style, but all of it will be indispensable as a reference text to any scientist or sanitarian who is concerned in any manner with milk.

The four parts of this book take up: (1) the constituents of milk; (2) the physical chemistry of milk and milk products; (3) the microbiology of milk and its products; and (4) the nutritional value of milk, and also the physiology of milk secretion. Numerous references are given at the end of each chapter, and there is an excellent index. The book is exceptionally well printed and arranged, for which the publishers and the editorial committee of the monograph series of the American Chemical Society deserve credit. The book can be recommended highly as well worthy of the great scientist and teacher to whom it is dedicated.

JAMES A. TOBEY

Laboratory Manual for General Biology and Fundamental Embryology

—By John Giesen. (2d. ed.) Milwaukee: Bruce Pub. Co., 1927. 215 pp., 11 figs. Price, \$1.80.

This is a laboratory guide for a typical elementary course in elementary zoölogy and botany, and the embryology of the frog and chick. It is in the form of a terse didactic outline of directions, with some supplemental data on the sources and care of laboratory material and the making of microscopical preparations. The author has not brought his nomenclature up to date, but still uses *Distomum* for *Fasciola* and *Trichina* for *Trichinella*. C. A. KOFOID

Anthelmintics and Their Uses in Medical and Veterinary Practice

—By R. N. Chopra and Asa C. Chandler. Baltimore: Williams & Wilkins., 1928. 291 pp. Price, \$5.00.

The present work is an extremely thorough and painstaking review of the subject of anthelmintics and reflects the wisdom of combining the viewpoint of a pharmacologist with that of a helminthologist. It is divided into three sections. Section I deals with general considerations such as methods of administration and investigation and with the correlation between chemical composition and anthelmintic action of drugs. In surveying the therapeutic agents that have been discovered the authors point out that among the intestinal worms, hookworms and their allies, ascarides, stomach worms and flukes are fairly susceptible; tapeworms moderately so; but oxyurids, *Strongyloides*, *Trichostrophus* and *Trichuris* are in the main non-susceptible. Only recently has progress been made with the somatic forms. Fair treatments have been devised for liver flukes, schistosomes and lung worms, but no effective treatment has been found for the filariae. This section

also includes a general survey of the worms infecting man and domestic animals to which is appended a key for eggs, larval forms and adults of the common worms.

In section II which deals with the drugs acting on gut parasites, two chapters are devoted to drugs acting on cestodes, the best known of which are male fern and allied drugs; ten chapters are devoted to drugs acting on nematodes and in the long list of agents especial attention is paid to such important remedies as carbon tetrachloride, oil of chenopodium, santonin and thymol. Chapter XV lists a number of proprietary anthelmintics, but the authors remark that although some of these have given fairly good results, they prefer to use ordinary drugs whose pharmacological and toxic actions are better known.

Section III consisting of three chapters is devoted to anthelmintics used against somatic worm infections. Particular attention is given to the antimony compounds and emetine and their use in schistosomiasis. The authors believe that emetine is not so efficacious as the antimony tartrates in the treatment of schistosomiasis and is, furthermore, much more expensive.

Throughout, each of the more important drugs is considered from the standpoint of history, source, chemical composition, pharmacological action and toxicity, dosage and anthelmintic effect. An exceedingly important feature of the book is an extensive bibliography covering 22 pages. The index is very well arranged in that the practical worker can find a list of the various drugs under each genus of worms. The present volume will be almost indispensable for either medical or veterinary workers interested in the treatment of worm infections, and should find a place in all laboratories dealing with any phase of experimental helminthology.

W. H. TALIAFERRO

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Portsmouth, Va.—Published as a part of the report of the city manager, the 1926 record of the Department of Public Welfare is creditable. A general death rate of 11.5 is somewhat higher than that for 1925 (10.7), due in part to a slight increase in deaths from pneumonia and cerebral hemorrhage. Six diseases caused over half of the 691 deaths, as follows: tuberculosis 38, cancer 23, cerebral hemorrhage 95, pneumonia 88, diseases of the heart 59, and chronic nephritis 57. It is noteworthy that only 1 death from typhoid was recorded. There were 1,029 births; and 100 infant deaths, of which 28 occurred during the first day, and 55 during the first month of life.

The laboratory division report shows a good range of examinations, with a total of 5,135, classified according to type. Commendable progress in this division is noted in comparison with the previous year.

Under the nursing division, it is noted that home nursing classes have been carried on, a central clinic, chiefly preventive, has been opened, and a health station, started in a colored section, has been active.

Newport, R. I.—The 1927 report of the Newport Board of Health is well arranged and informative. New and more spacious offices in the City Hall, with new equipment for laboratories and a dental clinic are noted. This city of 30,044 population, reports 447 births and 316 deaths, and an infant mortality rate of 40 deaths of infants per 1,000 births. A classified financial statement indicates an expenditure by the health department of \$25,778 for collection and disposal of wastes, and \$20,067 for purely health purposes.

There were 5 cases of diphtheria with

no deaths. A total of 2,689 children were given toxin-antitoxin, and 1,528 were given subsequent Schick tests, while 1,631 children who had not been previously immunized were given the Schick test. Active milk supervision has been exercised. The report concludes with many statistical tables worthy of study.

Hartford, Conn.—The 43rd report of the Hartford Board of Health for 1927 has a good light yellow cover, and on the second page contains an excellent statistical summary for the years 1926 and 1927. This city of 168,258 population had a resident death rate of 9.44, a resident birth rate of 20.2 and an infant mortality rate of 68.5. The death rate from pulmonary tuberculosis was 61.8. A decrease in deaths from lobar and broncho-pneumonia is recorded. Several good charts, most of them covering periods from 1881, and numerous statistical tables add interest to the report of progress.

Another year of successful coöperative work for infants and preschool children with the Visiting Nurse Association is noted by the health officer. Under the terms of the agreement, the city employs the V. N. A. as its agent to do the routine work at the health stations, and bills for their services at cost are rendered by them each month to the Board of Health. A total of 6,303 cases were registered, with 19,000 visits to the stations, in addition to the nursing visits to homes. A classified financial statement, with comparative figures for 1926 and 1927, shows a per capita expenditure in the latter year of \$1.40.

Greenville, S. C.—Greenville's annual report for 1927 is published in the monthly bulletin and is a record of prog-

ress for this city of 33,000 people. The number of diphtheria cases reported was half the number of the previous year, with no cases reported among colored children. During the past 2½ years, all of the colored school children have been immunized. A resident death rate of 10.5, with no deaths from diphtheria, scarlet fever, or typhoid fever, and an infant mortality rate of 73.5 are recorded. The standard milk ordinance was adopted in 1926, and a new ordinance is now before the council governing the manufacture and sale of ice cream. All slaughtering is done in a modern abattoir where ante-mortem and post-mortem inspections are made. An annual appropriation of \$1,500 per year is made for mosquito control work.

Los Angeles County, Calif.—The annual report of the board of supervisors of Los Angeles County, Calif., (year ending June 30, 1927) contains 318 pages with many financial and statistical tables, several attractive photographs, and a small amount of descriptive text. An effort is being made to protect unincorporated areas through proper zoning and the establishment of definite building lines in districts where deed restrictions have expired. It is stated as the policy of the Regional Planning Commission to obtain from, or have reserved in the larger subdivisions, suitable park, school playground, beach or other open spaces of recreational or public nature in order to maintain a balanced community.

In the health department report section it is learned that during the early part of the year, a severe epidemic of smallpox was quickly stamped out and 160,000 people were vaccinated free, "representing a saving to the people of at least \$200,000." During the year vaccines and serums for prevention of disease were distributed at a cost of approximately \$15,000. The population is said to have increased 2½ times dur-

ing the past 3 years, but communicable diseases have not increased to a similar extent. Laboratory services were increased 100 per cent in a year, for bacteriological work, and 30 per cent for chemical analyses.

Preventive work in tuberculosis control is carried out through the summer schools in coöperation with the county tuberculosis association. The infant mortality rate of 41 per 1,000 births is a record for a large rural district. There were 25,576 mothers who received free service on the education of the child at the health centers during the year. Co-operation has been established with 135 school districts in the joint employment of public health nurses. Twenty-five cities have coördinated their work with the county health department.

American Child Health Association.—The *Fourth Annual Meeting Transactions* (May, 1927) of the American Child Health Association are published in a volume of 380 pages. This is a valuable compilation of addresses dealing with the various problems of modern child hygiene work. Here may be found enlightening discussions of progress in child health as viewed by national organizations; the promotion of child health through recreation; trends in federal and state child health work; and experience in medical schools with courses in preventive pediatrics. Many interesting graphs, statistical tables, and charts are reproduced to show the present status of different aspects of health work as compared with earlier years.

The coöperative program of the association is effectively outlined by the general executive. "What we covet, therefore, is the opportunity of securing productive coöperative service, when desirable and expedient, with the official agencies upon which government has placed the responsibility of advancing the cause of child health. It has also been our pleasure to join with other

voluntary health agencies and with the great national social and civic groups in the fields of our common interest and endeavor.

As an illustration of the type of co-operative work undertaken, the nationwide campaign for clean and safe milk is described. After a working plan for a state survey has the joint approval of the state department of health, the state dairy commissioner and the representative of the association, the work starts in the survey phase. An effort is made to secure a picture of the actual sanitary and chemical quality of the marketed milk in a cross-section of the state, together with definite first hand knowledge of the problems associated with milk production and distribution. Experts then point out the defects in routine methods and equipment, and offer suggestions for betterment. Finally

comes the phase of interpretation and promotion when, through carefully planned follow-up of the survey, the results are interpreted to the various civic and social groups and the importance of milk in the dietary of the growing child is stressed.

Educational workers proceed similarly with respect to the schools. They sample and analyze educational thought and practice relating to school health programs; and interpret, demonstrate, and promote activities along modern lines of accepted practice. At present, the association is engaged in a study of the effectiveness of the health program in the schools of the country which should yield valuable information that may be used to measure, in terms of health status, habits and knowledge of pupils, and the effectiveness of existing school health activities.

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CANCER: A PROFESSIONAL RESPONSIBILITY AND A PUBLIC LIABILITY By Albert Soland, M.D. New York: Appleton, 1928. 143 pp. Price, \$1.50.

FOOTLOOSE OF THE TERTH By Leo Kanner, M.D. New York: Macmillan, 1928. 316 pp. Price, \$4.00.

LEARNING EXERCISES IN FOOD AND NUTRITION. By Anna Belle Robinson and Florence M. King. New York: Heath, 1928. 164 pp. Price, \$1.20.

THE GLANDS REGULATING PERSONALITY. (2d. ed. rev.) By Louis Berman, M.D. New York: Macmillan, 1928. 341 pp. Price, \$1.50.

SCHOOL HEALTH PROGRAMS FROM MANY LANDS. A Report of the Health Section of the World Federation of Education Associations. Held at Toronto, Can., August 12, 1927. New York: American Child Health Association and the Metropolitan Life Ins. Co., 1928. 269 pp. Price, \$5.00.

WHY MEN FAIL. Edited by Morris Fishbein, M.D. and Wm. A. White, M.D. New York: Century, 1928. 344 pp. Price, \$2.00.

A SHORT MANUAL OF INDUSTRIAL HYGIENE For Managers, Foremen, Forewomen and Industrial Supervisors Generally. By Leonard P. Lockhart, M.A. London: John Murray, 1927. 114 pp. Price, \$1.00.

FOOD AND HEALTH By A. B. Callow. London: Oxford, 1928. 96 pp.

THE BOOK OF GREEN VEGETABLES By Mollie Gold and Eleanor Gilbert. New York: Appleton, 1928. 100 pp. Price, \$1.50.

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A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

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ANON. Diphtheria Mortality in Large Cities of the United States in 1927. *J.A.M.A.*, 90:20 (May 19), 1928.

Typhoid Fever in 1927—Seven of the cities of more than 100,000 population had no typhoid fever deaths. Seventy-four had less than 2 per 100,000. There has been a progressive decline in each group for the past 3 years.

ANON. Typhoid in the Large Cities of the United States in 1927. *J.A.M.A.*, 90:20 (May 19), 1928.

Toxins of Hemolytic Streptococci—Polyvalent toxins from scarlatinal erysipelas and suppurative streptococci produced similar skin reactions and were neutralized by antitoxin prepared from any of the three toxins. The scarlatinal antitoxic serum was the most comprehensive in its neutralizing powers.

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lation living in the same neighborhoods. Persons harboring bacilli classified as avirulent may be of importance in the spread of the disease.

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NEWS FROM THE FIELD

LIVESTOCK LAWS

A close check-up on the laws governing the interstate movement of livestock and veterinary biological products, which has been made recently by the Bureau of Animal Industry, U. S. Department of Agriculture, has resulted in fines and jail sentences for the offenders. In the case of livestock quarantine laws, 4 violators were fined from \$100 to \$250 for driving or shipping cattle interstate without previous tuberculin test. Another violator was jailed. Five railroads were also penalized from \$100 to \$400 each for violating the 28-hour law, providing for the unloading of live stock for feed, for water and rest.

The license of one firm producing biological products has been revoked and another license has been suspended. Investigation showed conditions in the laboratories to be defective, insanitary and improperly conducted and the products contaminated.

COURSE FOR CONTINUATION SCHOOL WORKERS

A course in health education for workers in continuation schools will be inaugurated at Teachers College, Columbia University, with the opening of the college term in September, 1928. This is the first course of the kind ever to be offered in any university. The course is planned to meet the specific needs of continuation schools as they have been determined by a study made recently of the New York City Continuation Schools. The course will include Safety & First Aid in the Job; Posture and the Job; Nutrition for the Worker.

The course has been approved by the New York Board of Examiners and will be accepted for credit toward a teaching license for continuation schools. Thomas

A. Wood, M.D., professor of health education, Teachers College, will direct the course and will give some of the lectures. The lecturers also will include Hugh Grant Rowell, M.D., assistant professor of health education, and Anette M. Phelan, instructor in health education, Teachers College, John D. McCarthy, M.D., director health education for New York City Schools and others prominent in this field.

ROCKEFELLER HEALTH PROJECTS

MORE than \$11,000,000 was expended in 1927 by the Rockefeller Institute according to the report of George E. Vincent, M.D., president. Among the public health projects in the United States promoted by the Rockefeller Institute in 1927 were:

- Aided local health organizations in 85 counties in 6 states in the Mississippi flood area.

- Operated an emergency field training station for health workers in flood area and 9 other training stations elsewhere.

- Assisted 9 schools or institutes of public health and 3 departments of hygiene in university medical schools.

- Had a part in malaria control demonstrations or surveys in 8 southern states.

- Contributed to the health budgets of 265 counties in 23 states.

- Helped to set up or maintain public health laboratory services, or divisions of vital statistics, sanitary engineering or epidemiology in state health departments in 16 states.

- Made grants for mental hygiene work.

- Provided funds for biological research at 3 American universities.

T-A FOR PRESCHOOL CHILDREN

THAT health education properly directed coupled with effective organization will bring results is shown by the record of Batavia, N. Y., in its toxin-antitoxin campaign. During February and March, 910 children received three doses of toxin-antitoxin and of this number 312 were of preschool age. School

authorities, both public and parochial, the Parent-Teacher Association group, and the local newspapers coöperated in the campaign. The local board of health appropriated \$500 to pay the physicians who volunteered their services at the clinics.

POUGHKEEPSIE CITY FATHERS PROMOTE T-A DRIVE

THE Board of Aldermen of Poughkeepsie, N. Y., made an appropriation, by unanimous vote, of \$2,000 to meet the expenses of a toxin-antitoxin campaign carried on in May. An arrangement was made to pay physicians in charge of the clinics \$50 per clinic.

LYNN HABIT CLINIC

A new habit clinic has been established in Lynn, Mass. The clinic will be in charge of Dr. C. A. Bonner, superintendent of the Danvers State Hospital, Lynn, Mass., who is an expert in the field of mental hygiene of children. The clinic staff also includes Mary H. Holland, social worker, and Esther Reid, psychometrist.

PROTEST AGAINST DR. LEVY'S DISMISSAL

AROUSSED by the removal of Dr. E. C. Levy as health officer of Tampa, Florida, for political reasons only, the Hillsboro County Medical Society, Florida, has gone on record protesting against his removal.

Commending Dr. Levy for his harmonious coöperation with organized medicine and referring to the complete confidence of the medical profession which he enjoyed, the local medical society, through its committee on resolutions, with J. C. Mills as chairman, went on record claiming:

That in being deprived of the services of a man whose work here in Tampa has fully borne out his previous reputation as the best municipal health officer in the United States, Tampa has lost not only a most efficient guardian of the health of its people, but also that prestige and distinction that comes from having such a man at the head of its Health Department.

TEXAS TO BUILD CHEMICAL LABORATORY

THE Texas State Board of Health recently made provision for the erection of a \$25,000 state chemical laboratory to be directed by Dr. S. W. Bohlo. Dr. Bohlo will continue to direct the Pasteur Institute which is to be combined with the state laboratory. Maudie Marie Burns will be pathologist of the new laboratory.

The laboratory will be built on a state-owned square in the City of Austin and ready for occupancy September 1.

ECUADOR NEW PUBLIC HEALTH LAW

THE public health law of Ecuador of June 17, 1927, provides punishments of from 1 to 5 days in prison and fines of from 1 to 100 sucres, or both, for parents or guardians guilty of the following:

Placing child with nurse not having a certificate of health from a physician

Failure to have a child vaccinated against smallpox within a certain period of time

Leaving child locked in the house and going away to work

Failure to provide medical care promptly in case of a child's illness, when such neglect results in the death of the child

Punishments as stated above are also provided for mothers who decline to feed their children at the breast without having a physician's certificate stating their inability to do so.

RECENT DEVELOPMENTS IN CHILD WELFARE WORK IN MEXICO

STUDY of physical development of school children—The Department of Public Education of Mexico has just completed a report of an investigation of the physical development of school children between the ages of 4 and 17 in the Federal District. This investigation, which lasted 3 years, included mental as well as physical measurements.

Physical examination of school children—Physical examination of school children in Mexico City, which has been in practice more than 3 years, has been made more extensive this year. All children in the primary schools will be exam-

ined once a year and those needing medical attention will be sent to clinics and dispensaries for free treatment. All children in the secondary, technical, and preparatory schools will also be examined; they will not be sent to dispensaries, but will be given advice necessary for the treatment of the disorders found and the prevention of disease. The Bureau of Hygiene of the Department of Education is also concentrating its efforts on inculcating good health habits among the school children.

New measures with regard to kindergartens—A new division, that of general inspection of kindergartens, was established under the department of education. The staff of this division is in charge of a woman teacher, and consists of several women inspectors of kindergartens. Provision has been made by the new division for the establishment in Mexico City of 18 additional kindergartens as annexes to public schools. For this purpose the poorest districts have been selected.

PRENUPTIAL CONSULTATION CENTERS IN ITALY

A prenuptial consultation center was recently established in Genoa. Two others had been established previously, one in Milan and one in Turin. At these centers persons intending to get married are examined by physicians, and those already married are given hygienic and medico-legal advice.

ITALIAN NATIONAL BUREAU FOR MATERNITY AND CHILD WELFARE

ACCORDING to official information, the National Bureau for Maternity and Child Welfare of Italy, established in 1925, gave subsidies in 1927 of 5½ million lire to 428 maternity and infant welfare agencies, and of 6½ million lire to 606 summer camps in which 180,000 children were cared for. Other activities of the bureau included inspection of 509 institutions for children; giving 50

courses in child care for physicians, midwives, and trained welfare workers; establishment of 9 traveling courses in child care; and operation of 55 traveling child health centers and 53 pediatric and obstetric clinics.

FIRST CUBAN NATIONAL CHILD-WELFARE CONGRESS

A committee under the chairmanship of the Secretary of Health has been working on plans for the First National Child Welfare Congress in Cuba and has decided to hold the congress in December of this year. The congress will continue the work of the Fifth Pan American Child Congress, which was held in December, 1927. Its main objects will be:

1. To bring to the attention of the nation the necessity of giving good care to children
2. To familiarize the public with the progress made in the study of the child
3. To promote the study of hygiene, pediatrics, child psychology, and education
4. To work for the enactment of child-welfare legislation

The Congress will be divided into the following five sections: Hygiene, medicine, psychology and education, sociology and legislation, and defective and delinquent children.

CUBA'S TUBERCULOSIS CAMPAIGN

AS a part of Cuba's anti-tuberculosis campaign, plans for which were prepared by the Department of Health, the government has appropriated 3,000,000 pesos for the construction of several sanatoriums for tuberculous persons. Plans have been made also for the introduction of compulsory reporting of cases of tuberculosis by physicians; extension of the visiting nurse system; keeping of complete statistics of cases of tuberculosis; and education of the public through literature, lectures, motion pictures, etc.

Preventorium for children in delicate health who are not tuberculous will also be established.

PERSONALS

- DR. J. W. H. SMITH, formerly with the New Highland Sanitarium and Clinic, Martinsville, Ind., has become associated with the Ohio Valley General Hospital, Peterson Laboratory, Wheeling, W. Va.
- DR. R. A. STEPHEN has been appointed City Health Officer of El Cerrito, Calif., to take the place of Dr. W. W. Fraser.
- DR. JOHN D. KEYE is now City Health Officer of Holtville, Calif., having succeeded Dr. W. F. Mosher.
- DR. BENJAMIN H. VIAU has been appointed City Health Officer of Sanger, Calif.
- DR. HENRY L. K. SHAW, the first director of the New York State Division of Child Hygiene upon its creation in 1914, and since August, 1919, a department consultant in child hygiene, was elected president of the American Pediatric Society at the annual meeting held at Washington during the week of May 7.
- DR. W. A. DAVIS has been named secretary of the Texas State Board of Health.
- ERNEST LEMAY of Austin, Tex., is the new director of the food and drugs section of the Texas State Board of Health.
- DR. GEORGE H. WILLCUTT has been appointed City Health Officer of Ross, Marin County, Calif. to succeed Mr. M. H. Edgar.
- SURGEON R. M. GRIMM has been relieved from duty at the American Consulate at Antwerp, Belgium, and has been assigned to duty in the American Consulate in Dublin, Irish Free State.
- SURGEON C. H. WARING has been relieved from duty at the Hygienic Laboratory, Washington, D. C., and has been assigned to duty in the American Consulate in Antwerp, Belgium.
- A. L. DOPMEYER, Associate Sanitary Engineer, has been relieved from duty in Interstate Sanitary District No. 4, Memphis, Tenn. on June 15, and has been assigned to duty in Interstate Sanitary District No. 5-6, in San Francisco, Calif.
- DR. PERRY F. PRATHER, Hagerstown, Md., has been reappointed Health Officer of Washington County, Md.
- EDMUND V. COWDRY, Ph.D., of the Rockefeller Institute for Medical Research, New York, N. Y., has been appointed Professor of Cytology in Washington University Medical School, St. Louis, Mo.
- DR. GEORGE M. JENNINGS, Missoula, Mont., was elected president of the State Board of Health on April 5.
- SIR ARTHUR NEWSHOLME, formerly Principal Medical Officer of England and Wales, visited New York City, to make a study of the Health Department's reorganization plan.
- DR. GOLDSBOROUGH F. MCGINNES has been appointed Director of Laboratories of the Virginia State Department of Health to succeed Aubrey H. Straus, who has tendered his resignation, effective June 15. Dr. McGinnes was formerly Health Officer of Isle of Wight County, Va.
- DR. WILLIAM F. WILD, formerly with the American Child Health Association and with the American Society for the Control of Cancer and the Minnesota Public Health Association, has been appointed Health Officer of Bridgeport, Conn.
- DR. JAMES W. BENHAM has been appointed Health Officer of Columbus, Ind. to succeed Dr. John R. Miller.
- DR. RODNEY M. AREY has been appointed City Health Officer of Muscatine, Ia., to succeed Dr. Arthur L. Bryan.
- CHARLES-EDWARD A. WINSLOW, Dr. P. H., Professor of Public Health at Yale University, has been appointed Cutter Lecturer on Preventive Medicine at Harvard University for 1928-29.

DR. THOMAS R. BROWN, Baltimore, Md., has been reelected president of the Johns Hopkins Medical Alumni Association.

DR. FRANK A. HOHENSCHUH has been appointed City Health Officer of Clifton, Ia.

DR. ERESTUS T. HANLEY has been reappointed City Health Officer of Seattle, Wash.

DR. JOHN A. WESSINGER has been reappointed Health Officer of the City of Ann Arbor, Mich. for a term of three years. Dr. Wessinger has served the city continuously for twenty-two years.

ANNE HASBROUCK, formerly with the Brooklyn Health Council, became superintendent of the Reconstruction Home at Elmira, N. Y. on June 1. This institution is supported by the State District Rotary Club.

DR. H. B. EHLE has succeeded Dr. G. S. Martin as Health Officer for Lassen County, Calif.

DR. W. H. ZIEBER has been appointed City Health Officer for Menlo Park, San Mateo County, Calif.

HENRY P. TALBOT, M.D. has been appointed chief of the division of venereal disease, Connecticut State Department of Health. He assumes his duties July 1. Dr. Talbot was formerly with the Public Health Service, Marine Hospital at Ellis Island.

DR. A. J. BURCH has been appointed part-time Health Officer of Catron County, N. M. He is successor to Dr. A. A. McDaniel who has moved from the county.

CONFERENCES

August 6-10, American Hospital Association, San Francisco, Calif.

August 6-10, American Occupational Therapy Association, San Francisco, Calif.

September 12-14, Southern Conference

of Tuberculosis Secretaries, Biloxi, Miss.

September 17-19, Mississippi Valley Conference on Tuberculosis, Des Moines, Ia.

September 18-21, New England Water Works Association, Montreal, Can.

September 25-28, American Roentgen Society, Kansas City, Mo.

October 4-6, Association of Military Surgeons of the United States, Baltimore, Md.

October 11-13, Canadian Public Health Association, Winnipeg, Can.

October 11-13, International Association of Dairy and Milk Inspectors, Chicago, Ill.

October 15-16, Conference of Illinois State Health Officers, Chicago, Ill.

October 15-19, American Child Health Association, Chicago, Ill.

October 15-19, American Social Hygiene Association, Chicago, Ill.

October 15-19, American Public Health Association, Chicago, Ill.

FOREIGN





July 8-13, First World Congress of Social Workers, Paris, France.

July 16-21, Thirty-ninth Congress Royal Sanitary Institute, Plymouth, England.

July 28-August 4, World Federation of Education Associations, Geneva, Switzerland.

September 25-27, Sixth International Conference on Tuberculosis, Rome, Italy.

October 29-November 1, Second International Conference on Light and Heat in Medicine, Surgery and Public Health, London, England.

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American Journal of Public Health

and THE NATION'S HEALTH VOL. X NO. 8

Volume XVIII

August, 1928

Number 8

Supervising Venereal Disease Carriers*

RAYMOND S. PATTERSON, Ph.D., FELLOW A. P. H. A.

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THE study of known cases of the common communicable diseases to detect sources of infection and contacts is a generally accepted function of health departments. Though detecting diphtheria carriers has been accepted for some years as a reasonable procedure, a systematic tuberculosis case-finding campaign has not generally been made a part of official local health programs. To contract diphtheria was a misfortune; to suffer from tuberculosis was somewhat of a disgrace. Hence we took aggressive measures against diphtheria, but confined our early antituberculosis programs to the building of hospitals and sanatoria for the unfortunate victims of the disease. Not until the Framingham demonstration had shown the way, were case finding programs generally advocated for health departments. If the popular attitude toward tuberculosis delayed the adoption of case finding measures, it is easy to imagine the effect of the stigma of gonorrhea and syphilis upon venereal disease control.

Prior to the war, few hospitals maintained venereal disease clinics in their outpatient departments; little was known of the prevalence of the infections; and nothing was done to find infectious persons and to induce them to accept the limited treatment facilities available. The war emergency revealed the true status of venereal diseases, and a herculean attempt was made to combat them. The war measures consisted principally in a nation-wide extension of the meager medical facilities, an aggressive educational campaign, and the repression of commercialized prostitution.

Clinic facilities for free diagnosis and treatment are essential; for otherwise indigent patients, suspected carriers who are required to

* Read at the New England Public Health Institute, Providence, R. I., Sept. 30, 1927.

submit to examinations, and infectious cases under compulsory treatment cannot be cared for. But medical treatment facilities alone without social service are an ameliorative rather than a preventive measure. All are agreed that sex education is an important factor in preventing venereal infections, and hence should not be neglected; yet none is so sanguine as to believe that information about the dangers of venereal infection alone will deter all persons from exposing themselves to these diseases. Again, vice repressive measures are equally indispensable, for they make commercialized prostitution difficult and thus tend to close the most fertile avenue for the spread of the diseases. Yet police repression of public prostitution cannot prevent the much more numerous clandestine prostitutes from spreading infection. These three measures have been carried on in New Jersey since the war as in other states, but important as they are they lose their effectiveness unless they supplement a determined effort to find through epidemiologic methods the relatively few infected persons who are sexually promiscuous. In New Jersey this additional step has been taken, i.e., the detection and supervised treatment of the persons responsible for the spread of the venereal diseases.

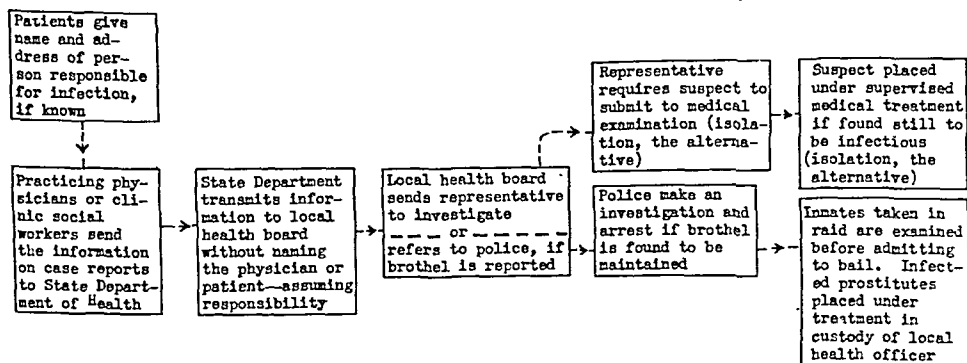
For the past five years the New Jersey State Department of Health has urged practicing physicians and clinic social workers to obtain information about the source of infection from all patients recently infected with a venereal disease, and to include the name and address of the source in their case reports. The response to the request was slow at first, but the continued improvement has been encouraging, for the number of physicians who give this assistance has increased to the point where for the past two years about one-tenth of all the case reports (chronic and acute alike) have included in them the name and address of the probable source of infection. The percentage of active cases giving the desired information about the source is much greater than one-tenth, for in the clinics in the larger cities the social worker who takes the patient's history obtains the information about the source of infection. As she is the deputy of the local health officer, the social worker investigates the reputed source immediately, and therefore does not include sources of infection on the case reports which she sends to the State Department of Health because the information is unnecessary.

In New Jersey, physicians report venereal disease cases direct to the State Department of Health instead of to the local registrar. When reports in which a source of infection is named are received from practicing physicians, the State Department of Health, without divulging the name of the physician or his patient, sends to the local health board

having jurisdiction the name and address of the suspected person. If a house of prostitution is named as the place in which the infection was contracted, this information is referred through the health officer to the police officials having jurisdiction, with the request that an investigation be made and the appropriate action be taken to close the house. More than a hundred brothels or professional prostitutes were reported in this manner during the past year and have been investigated by police officials.

If a man or woman is named as the source of infection, the venereal disease social worker or, if none is employed, a nurse or an inspector delegated for this work by the health officer investigates the report. If the investigator is successful in locating the person suspected of being a focus of infection, guarded inquiries are made about the suspect, and, unless the person's reputation is above reproach, he (or she) is informed that the State Department of Health has reported him (or her) as suspected of being infected with a communicable disease and that the law requires the health officer to demand a physical examination either by the family physician or at the public clinic. The suspected person is assured that no publicity has been or will be given to the investigation and that no one will be informed of the nature of the suspected condition as long as treatment is continued.

In only a very few cases, among the many hundreds of such investigations made during the past five years in New Jersey, have persons been named whose reputation was such as to make it inadvisable to ask the person to submit to examination. When this has occurred, the investigation has been dropped on the assumption that such a person would be unlikely to expose many persons to infection and that it would be better not to require a person possibly innocent of illicit sex relations to submit to examination. It should be noted that when suspected persons are approached they assume, usually, an attitude of injured



STEPS IN FINDING FOCI OF VENEREAL INFECTION

innocence, but the fact that they have been reported by the State Department of Health to the local health departments and that the health officer is "after them" causes them to think twice before their protestations of virtue lead to active opposition to the health officer's wishes.

The following report on a referred case from the venereal disease social worker in one of the large New Jersey cities is typical. Sometimes the protestations of innocence worry the inexperienced investigator, but this matter-of-fact statement indicates that the subject did not make much of an impression on the social worker.

Dear Doctor:

In reply to your letter of the 8th, relative to a case of syphilis contracted from "Miss Mary" at 172 B. Street, I would advise as follows:

Mary R— of the above address was interviewed and vehemently denied having venereal disease. A smear was taken which proved positive and a Wassermann test was four plus. Inasmuch as she is a food handler, her permit will be revoked. We will keep her under strict supervision and advise you of any further developments.

The tactful but firm nurse or health inspector finds little difficulty in inducing such people to submit voluntarily to examination and to remain under treatment if, and when, found infected.

The letter introduces another consideration—that of the incomplete or vague name and address. Frequently physicians can obtain only a nickname or a first name, or the approximate location of a house on a given block. Obviously, such information is of less value than exact names and addresses, yet we have found that an experienced investigator can work wonders with very meager help. Physicians should be impressed with the importance of pinning their patients down to get as much information as possible, yet the physician should be encouraged to transmit whatever information he may get, even though vague. A half loaf is better than none in this instance.

Only in a score of the larger cities are venereal disease social workers or public health nurses with social training employed on the staff of the health department. In many of the smaller incorporated municipalities, a public health nurse may be available for occasional venereal disease follow-up, but in most of the suburban and rural areas no official with any health training is available. In New Jersey, unfortunately, as in New England, each township committee is constituted a board of health. Usually some corner-store clerk is designated as the executive officer, and as a rule he is innocent of any knowledge of the science of public health. The State Department of Health has adopted the policy of sending a representative to visit such rural officers when the first case is to be referred to them. They are impressed with the

necessity for secrecy and tact in dealing with suspected cases, and the state official goes with the local health officer and demonstrates the technic of the interview. Frequently these part-time, untrained officials "catch on" surprisingly well once the way is shown. The following letters tell the story of work well done by a local health officer of a New Jersey coast town.

Dear Sir:

Replying to yours of the 11th, will say that I have located the man, and compelled him to undergo an examination by Dr. H—, this city, the result being positive.

I have ordered him to report to Dr. H— as often as required for treatment, with the assurance that if any more cases are reported as being infected by him after this date, he will be locked up for the protection of the public.

Dear Sir:

Replying to yours of the 15th, asking that I have Helen R— examined, if not being treated by a physician for syphilis, she being accused by Jerry B— of infecting him. Our school nurse interviewed her, and she told her that she was under the care of Dr. D—, which he verified and says she is getting along all right. She says Jerry is a liar, for he gave it to her.

Note: The name of the woman's accuser was not given by the State Department of Health. We do not know how the Health Officer learned it.

Dear Sir:

Your communication regarding the case of Emily W—, she being reported as a source of syphilitic infection, was received at 9:00 a. m. this morning. I at once sent my assistant, Miss H— who is also the school nurse and a very efficient one, out on the case.

She reports the girl to be only about sixteen years old, very attractive, and without any knowledge of the seriousness of her condition; she will go under the care of Dr. B—, going to him this evening for the first treatment. He is the representative of the Bureau of Venereal Disease Control.

This case was disposed of at 10:30, ninety minutes after receiving your letter.

Not all rural health officials take kindly to the suggestion that venereal disease follow-up is a legitimate local health function. Some few react as did the following:

Gentlemen:

Replying to yours of the 17th inst., concerning investigation of case of Helen C—, will say we received Dr. B—'s resignation, and we have had no health board meeting, hence no action. I am not sure whether you are inferring that it is my duty to look after and investigate these cases or not. I had a little experience some few years ago and don't care for any more. However, if this is one of the requirements of me, inform me definitely and I will either do the same or resign as Dr. B— did. That is his reason for resigning. From what I hear there is a chance for cleaning up several at this house.

Other rural health officials interpret the law in their own way. For instance, the next officer, a doctor, seems not to be greatly impressed with the provision of the state law which authorizes health officials to

cause suspected persons to be examined. In this instance, the original letter asking that Mrs. Anna A— be examined as a source of gonorrhea was not acknowledged, and several of the usual follow-up letters, each a little more stern than the preceding, failed to make any impression until the following answer was received:

Dear Doctor:

All your communications, referring to Mrs. Anna A— as suffering with gonorrhea, received.

Will say I have attended the A— family as long as they have lived in town, and as she never said anything to me about having had gonorrhea, at first I thought I wouldn't have anything to do with it.

This is the reason I made no reply. A few days ago she was telling me some of her troubles, so I asked her about it. She said she had taken no treatment for it, and neither Mr. A— nor herself suffered any. I suppose by that, she hasn't it.

Others seem to think that the state regulation requiring two negative smears before the case is discharged is a little too onerous for comfort, and occasionally we get such a reaction as this:

Dear Doctor:

Your letter of recent date, relative to one Adelaide Y— received and contents noted: would say in reply that on behalf of the Board of Health of Clemens Township you are granted full authority to go ahead and make the examination of Adelaide Y— of Laurelton, as you suggested the State Board was not satisfied with the one negative report made and sent by Dr. T—.

As far as we are concerned, knowing the facts of the case, we are satisfied with the report of Dr. T— and considered the matter closed.

I am directed to say to you that you may make the examination if you wish on your own responsibility and at your own expense.

By and large, the local health officials of New Jersey respond readily and efficiently to the request that suspected carriers of venereal disease be examined and placed under supervised treatment. In other words, venereal disease case finding is a practical procedure, for it is producing results in New Jersey, where conditions are comparable to those of the New England States. By this method it is possible to detect the persons who are the worst offenders in spreading venereal diseases, and if the worst offenders are taken care of the occasional offender will be less dangerous.

It may be assumed that, although gonorrhea and syphilis are very prevalent diseases, the number of persons suffering from these diseases in an infectious stage and who are actively engaged in spreading the infections to others is not very great in any one community. Sooner or later each will infect a person who will go to a physician or clinic for treatment. With cooperating physicians and active health departments, it is reasonable to assume that the proposed method will be

effectual in stopping the important avenues for the spread of venereal diseases.

Important as is this procedure, other means of discovering cases, of course, cannot be neglected. Voluntary and other official agencies can assist the health officer in detecting and referring for treatment suspected venereal infections among persons presenting other social problems. The police department can assist by having examined all persons arrested on charges involving sex offenses, and health officials are justified in demanding that the police repress all open prostitution. Industrial medical departments and employment agencies are another fertile source for the detection of unrecognized cases, and the infant hygienists will find important leads from stillbirths, neonatal deaths, and other conditions where congenital syphilis can be detected. The details of these supplementary venereal disease control activities are too involved to permit of discussion here. Some of them are described in two earlier papers on venereal disease case finding.¹

If we offer treatment only to those who seek it voluntarily, if we place too much faith in the influence of sex information upon human behavior, if we think of sexual promiscuity in terms of vice districts, and neglect that "gold mine" of information—the recently infected venereal case now under treatment—we are neglecting the most effective method of attacking today's most dangerous preventable diseases—gonorrhea and syphilis.

REFERENCE

1. Finding Venereal Infection Sources, *Nation's Health*, 9:6 (June), 1927; and Municipal Responsibility in Venereal Disease Control, *Pub. Health News* (New Jersey State Dept. of Health), 12:8 (July), 1927.

Promotion of Physical Education in Italy

A recent royal decree provides an annual appropriation of 10,000,000 lire (beginning with the fiscal year 1928-29) for the recently established National Bureau of Physical and Moral Education of Young People. The decree also gives the bureau charge of the physical education of children in elementary public schools and in all private schools and authorizes it to establish normal schools for the training of teachers of physical education. The establishment of such a school in Rome has already been decided upon, and 400 applications for admission have been received.—*Rassegna della Previdenza Sociale*, Rome, Jan., 1928, p. 101.

Study of Urban and Rural Tuberculosis Death Rates in New York State

JESSAMINE S. WHITNEY

Statistician, National Tuberculosis Association, New York, N. Y.

IS THE rural death rate from tuberculosis higher and is it declining at a slower pace than that of the city? This question has been the subject of a good deal of discussion ever since it was raised by Dr. Allen K. Krause, Editor of the *American Review of Tuberculosis* in the March, 1926, issue of that journal. An answer to the question has been attempted in the study outlined in this article.

New York State's figures are used as a basis of comparison because they are fairly typical and also because a detailed analysis of the records was made possible by the New York State Department of Health. It is probable that any other state in the Union where there are a number of sanatoria located in rural territory will find a similar comparison. Dr. Krause pointed out that between 1913 and 1918 the rural tuberculosis rate of New York State was below the urban rate, but that during 1918 the rural line crossed the urban, and from that time until 1925 the rural tuberculosis rate in New York State had exceeded the urban rate and in 1924 reached almost twice the urban rate.

To arrive at any understanding of the significance of these figures, or the possible reasons therefor, one must be somewhat familiar with the methods used in collecting the data on which the death rates are based. The usual custom is to consider as a part of the mortality of any district all deaths which occur in that district whether of residents or non-residents. This plan is in operation in New York State and therefore recorded tuberculosis death rates are not an accurate measure of the amount of tuberculosis in any community, but show only the number of cases terminating fatally in that territory.

Then again it is germane to a discussion of this sort to know exactly what is meant by "urban" and "rural." The former term usually connotes a busy city and the latter a pastoral scene dotted with farm-houses. That is all right for literature, but in statistics clearly defined limits must be drawn since we are dividing all territory in New York State into the two classes.

Up to the year 1922 the New York State Department of Vital Statistics classified as urban all cities and three large villages, making the dividing line of population 10,000; that is, those cities and villages

having a population of 10,000 or over were classed as "urban" and all other territory was classed as "rural."

In 1922 the classification was changed and the dividing point in population between urban and rural was placed at 2500. All incorporated villages of 2500 or more population and all cities were included under the heading "urban," and the rest of the state classed as "rural." It is a question whether a village of 3000 should properly be considered "urban"; but it is equally questionable whether under the prior classification a village of 9,500 could correctly be considered "rural." In the graphs made by the New York State Department of Health for Dr. Krause's editorial the figures were kept consistently according to the 10,000 population division throughout, although a change in actual practice occurred in the middle of the period studied.

Dr. Krause sums up the picture as shown by the graph as follows:

This trend, it is plain, is a mounting ratio of rural to urban tuberculosis, which has been going on for at least 13 years, to reach a point at present which puts rural well ahead of urban mortality. During the last 5 years the trend has been greatly accentuated, as it expresses, no doubt, a static or slightly rising rural rate set against an accelerated urban decline Were this the portrayal of merely an addition to rural columns of decedents transferred and subtracted from their urban residences, its uniformly expanding character could be explained only by the condition of an ever increasing number of deaths of city dwellers in the country.

Had Dr. Krause stopped here he would have had the answer. But he chose to go further and to somewhat repudiate this explanation by quoting from Dr. Eichel, then Statistician of the State Department of Health, to the effect that the annual number of non-resident deaths formed an almost constant percentage of the recorded deaths, so that the general trend of mortality was not affected. When Dr. Eichel made that statement he was discussing tuberculosis death rates in the 10 largest cities of the state, and for them the statement is undoubtedly true. It is not true for the situation in rural territory.

To arrive at such a positive statement as the above we accepted, to a limited extent, Dr. Krause's challenge for an analysis in greater detail of the vital statistics of New York State. The main point at issue, already defined by Dr. Krause, is whether the rural tuberculosis rate represents a mortality of decedents actually residents of rural territory. To ascertain this a study was made from information contained in the death certificates themselves.

The years covered were 1917 to 1924 inclusive, since prior to the year 1917 the vital statistics records were not available in the same forms as for later years. The records of the years 1925 and 1926 were in process of current tabulation and compilation and could not be made available for the purposes of this study.

Since the classification for "urban" and "rural" had been changed in 1922 to a division point of 2500 population, it was felt that either the former or the latter classification should be carried throughout, as changing the areas in 1922 might seriously vitiate the significance of the data. We have chosen to use the later classification throughout; that is, to consider as rural all unincorporated territory and all incorporated places under 2500 population. This certainly more clearly defines "rural" territory, than the former classification even if the remaining territory is not so clearly "urban," for it is with the changes in rural conditions with which we are chiefly concerned. This will account for the discrepancy between the official figures and those given in this study, although the total tuberculosis deaths for each year in each county and for the state as a whole will of course be the same as the official figures.

In the whole of New York State there were in the 8 years under consideration approximately 103,000 deaths from tuberculosis, of which over 16,000 occurred in rural territory. To discover from observation of the original death certificates themselves the usual place of residence of rural decedents and the time of their residence at the place of death was the method of this study.

It comprises data on 16,347 deaths from tuberculosis in rural territory in New York State during 8 years, 1917 to 1924 inclusive. Of this number 7,967 deaths or 49 per cent, were deaths of non-residents of the districts in which the deaths occurred. But this figure of 49 per cent is an average figure for the 8-year period. As a matter of fact, the percentage of non-resident tuberculosis deaths in rural New York in 1924 was 57, an almost steady per cent increase being shown from 1917 when the corresponding figure was 41 per cent.

From the careful analysis of the data there can be but one answer to the question as to the cause of the higher rural tuberculosis rate; namely, the deaths occurring in sanatoria and other institutions located in rural territory. In the very summer of 1918 when according to Dr. Krause's article the rural rate rose above the urban rate, the United States Army General Hospital No. 8, with 1000 beds for returning tuberculous soldiers was established in the rural part of Orange County. Although it was in operation only 2 years it accounts for about one-third of all non-resident deaths in Orange County in the entire 8 years. The large Monroe County Hospital, Loomis Sanatorium in Sullivan County, Onondaga County Sanatorium, the Samuel W. Bowne Memorial in Dutchess County, to cite only a few of the many, are all located in rural territory.

In 1917 there had been established in rural New York State 24

sanatoria with a capacity of 2868 beds. By 1923, there were 41 sanatoria in New York State in rural territory with a capacity of 4511 beds, a 57 per cent increase of rural beds in 6 years. There was almost exactly twice that increase in deaths in rural tuberculosis sanatoria in the same 6-year period; viz, an increase of 115 per cent.

Only 30 per cent of non-resident rural deaths were in private homes, 54 per cent were in tuberculosis sanatoria and the remaining 16 per cent in what were classed as "other institutions" although most of them were in tuberculosis wards or divisions of general hospitals. There were a few scattering deaths at county farms and in so-called "health farms." If the tuberculosis sanatoria deaths and those in "other institutions" are grouped, as they may properly be, 70 per cent of all non-resident deaths in rural territory are in tuberculosis institutions. But this figure of 70 per cent is the average for the 8-year period. It ranges from 61 per cent in 1918 to 80 per cent in 1924.

Let us now summarize the facts for 1924, the latest year of the study. Of all the tuberculosis deaths in rural territory 57 per cent were of non-residents of the territory in which the death occurred, and 80 per cent of all these non-resident deaths occurred in tuberculosis institutions.

To make clearer the picture of the migratory character of the tuberculosis decedents in rural territory, a classification was made of the number resident at the place of death less than 3 months prior to death, and it was found that 44 per cent of the non-resident deaths during the 8-year period fell into this class. For 1924, the last year of the study, the corresponding figure was 48 per cent. The average length of residence in the district where death occurred was 6.7 months. This figure ranged by counties from 3 months in Tioga County to 8½ months in Essex County, one of the famous health resorts of the state.

For a fuller knowledge of the rural situation, it was necessary to know from what sources the migration to rural territory had been made. Obviously some of it might come from other rural territory in the state and be properly a part of the rural rate. This part of the study is perhaps one of the most important phases of it. It was found that 10 per cent of the non-resident rural tuberculosis deaths were of persons who resided outside New York State; 15 per cent were of non-residents (clearly specified on the death certificate as having resided less than a year in the district) but for whom the usual place of residence was not entered; and the remaining three-fourths were residents of other sections of New York State, 62 per cent residing in urban and 13 per cent in other rural New York territory.

If the 15 per cent for whom the residence was not given be distrib-

uted according to the ratios found for known residence the figures would then show that 73 per cent of rural decedents came from urban territory, 15 per cent from other rural territory, and 12 per cent from outside New York State. The 12 per cent from outside New York State are, as might be expected, found almost exclusively in Essex, Sullivan and Orange Counties, health resorts famous throughout the country. The United States Army General Hospital in Orange County furnished one-sixth of the deaths of persons whose homes were outside New York State.

The question as to the greater propensity for migration in search of health between male and female sufferers from tuberculosis is settled by the fact that during 8 years in New York State the percentage of male deaths to all non-resident deaths in rural territory was 61. The lowest percentage of male deaths was found in Schuyler County (25 per cent) and the highest in Orange County (81 per cent), the county where the United States Army General Hospital was situated. Even with the figures for the latter county excluded the males were 60 per cent of the total.

The total non-resident deaths in rural territory were classified into broad age groups: under 15, 15 to 24, 25 to 54, and 55 and over. No facts of especial significance were brought out through this phase of the study. As might be expected, 86 per cent were at the ages 15 to 54, only 3 per cent children under 15, and 11 per cent older persons, past 55.

The tuberculosis death rates for urban and rural New York State (uncorrected) based on a 2500 population division are given in Table I.

TABLE I

Year	Urban	Rural	Year	Urban	Rural
1917	140.6	134.7	1921	80.0	108.4
1918	135.3	127.0	1922	75.6	106.7
1919	159.8	119.0	1923	78.0	101.2
1920	93.2	117.8	1924	76.7	94.2

Even these uncorrected recorded rates show a steady decline in the rural tuberculosis rate as in the urban, which has been continuous for at least 8 years.

On the basis of the findings of this study we can correct those rates year by year by deducting from the rural mortality the percentage of non-residents found among the decedents for each of those years. A correction must also be made for non-residents from other rural territory whose mortality properly belongs to the rural rate. When these two corrections are made the rural rates for the 8 years are as follows:

The corrected rural rates eliminating non-residents fall far below the corresponding urban rates and the trend is downward. (See Figure I).

TABLE II

New York State			New York State		
Year	Tuberculosis rural rate uncorrected	Corrected for non-residence	Year	Tuberculosis rural rate uncorrected	Corrected for non-residence
1917	134.7	90.1	1921	108.4	59.5
1918	127.0	85.8	1922	106.7	58.8
1919	119.0	73.3	1923	101.2	57.0
1920	117.8	68.4	1924	94.2	48.9

Rates

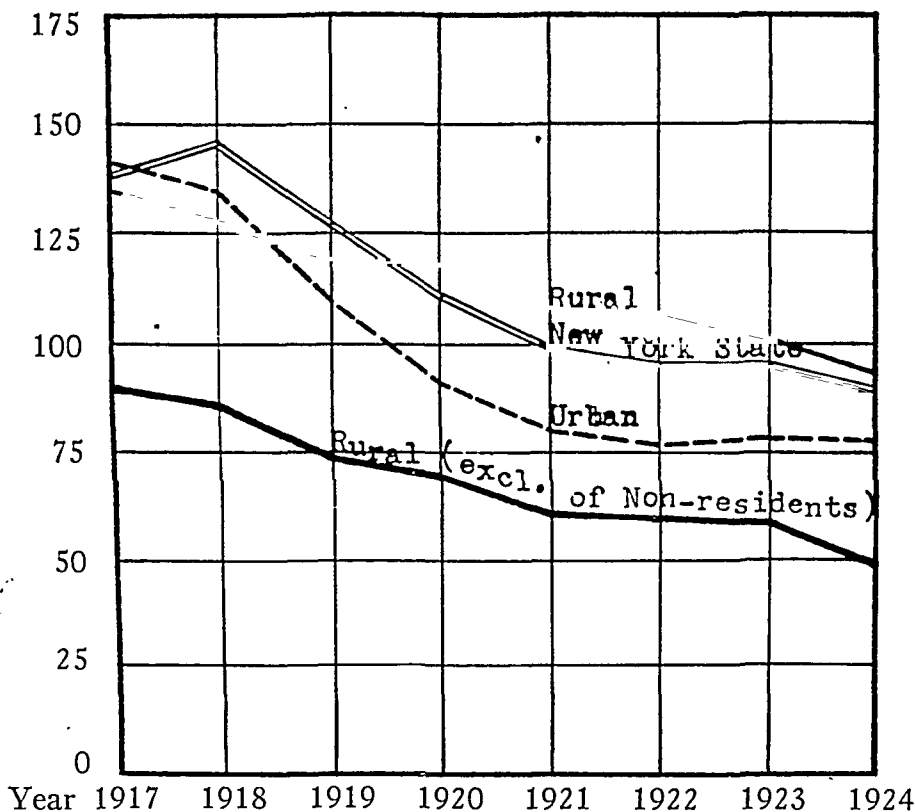


FIGURE I—Urban and Rural Tuberculosis Death Rates with Rural Rates corrected for Non-residents. New York State, exclusive of New York City, 1917-1924.

To this the question may be raised: that is all right for a correction of non-residents in rural territory, but how about the correction of rates in urban territory? Are there not equivalent percentages of tuberculous persons who go to urban institutions and die there, who properly belong in rural territory?

Fortunately this matter has already been answered for us by two studies. In 1922 Dr. Otto Eichel then Director of the Division of Vital Statistics in the New York State Department of Health, made a

correction of all tuberculosis deaths for residence in which he charged all tuberculosis deaths to the district in which the decedent resided when the disease began. His findings were referred to by Dr. Krause.

Dr. Eichel found that in correcting the tuberculosis death rates, not only the New York City rate was raised from 3 to 5 points but that the adjustment for the 10 largest cities in the state showed that in all but 2 the rate after correction for non-residence was higher than the usual recorded rate.

We have still another study just completed by Dr. J. V. De Porte, Director of the Vital Statistics Division of the New York State Department of Health. For the year 1926 all tuberculosis deaths in New York State were re-allocated to the districts which were the usual places of residence of the decedents, and Dr. De Porte's figures show that on this basis the rural and urban rates change places; that is, that the corrected urban rate is even farther above the rural than the rural exceeded the urban in the recorded rates. The actual figures are as follows:

TUBERCULOSIS DEATH RATES IN NEW YORK STATE PER 100,000 POPULATION, 1926			
Urban		Rural	
Recorded	Corrected for Residence	Recorded	Corrected for Residence
70.4	83.2	87.5	59.4

Dr. De Porte's figures for 1926 show that the actual rural rate is only two-thirds the recorded rate, while the actual urban rate is 18 per cent higher than the recorded urban rate.

SUMMARY

The usual recorded mortality rates from tuberculosis for rural and urban territory are fallacious in that they do not represent the actual mortality of the various sections.

Rural tuberculosis mortality rates are controlled by the deaths of persons in tuberculosis institutions. In New York State the number of beds for tuberculosis in rural territory have increased 57 per cent in the last 6 years. The increase in deaths in rural tuberculosis sanatoria has increased 115 per cent in the same time.

Fifty-seven per cent of persons who die in rural territory are non-residents of that territory. Eighty per cent of all non-resident rural deaths occur in tuberculosis institutions.

When an actual analysis of tuberculosis deaths is made and non-residents are allocated to their home area the rural tuberculosis rate becomes only two-thirds the recorded rate while the urban rate is increased by 18 per cent.

The actual rural tuberculosis rate is considerably lower than the urban in New York State and is declining.

Advancement in Mosquito Control in the United States and Canada*

BY questionnaire, the committee obtained information on mosquito control activities from the health departments of 42 states and provinces in North America and from the territory of Alaska.

These units are grouped in 4 classes and under each classification, a summary of the activities of each state or province is given.

GROUP No. 1—States and provinces in which mosquito control operations are being carried on:

New Jersey—Control of salt marsh mosquitoes continues to be the greatest problem. Malaria mosquitoes have appeared only rarely in two or three counties, principally in unprotected areas. Salt marsh ditching has gone on; several million feet (when figured on a 10" width basis) are being cut each season, with the result that this phase of work approaches completion in a number of counties. Ditch cutting and cleaning machines are in use in several places; Hudson County employs electric pumps for drainage purposes; mowing machines have been used in several counties to clean up ditch edges and to afford access to swamps; tractors have proved helpful in transportation of oil, and power oil sprayers are in use. Due to dissatisfaction with the spreading, lasting and killing properties of fuel oil, the State Experiment Station will coöperate with oil companies to produce a more suitable oil. The State Experiment Station has also developed a new mosquito trap.

County-wide control was continued in 10 counties operating under the State Mosquito Control Laws and it is expected that 2 more counties will soon engage in this work in the same manner. Although the season was favorable for mosquito production, annoyance in the metropolitan districts was but slight. Where salt marsh mosquitoes have been largely eliminated during the last 10 years from New Jersey coastal areas, there has occurred an annual average increase in taxable values of 75 per cent more than where the mosquitoes are still present.

Illinois—Malaria prevails in the 12 southern counties and pestiferous mosquitoes are more or less annoying throughout the whole state. *Culex* production in sewage polluted water courses around Chicago has been enormous. In the south, 3 additional cities inaugurated

* Abstract of Report of the Committee on Mosquito Control, delivered before the Public Health Engineering Section of the American Public Health Association at the fifty-sixth Annual Meeting at Cincinnati, O., October 19, 1927.

control work and numerous lakes and ponds were stocked with minnows. In sparsely settled swampy areas, screening, destruction of adult mosquitoes and quinine sterilization are practiced. To determine the economic importance of predominant species, and having in view the control of all annoying mosquitoes, some experimental work was done in the northern part of the state. Around Chicago and its environs, intensive control work resulted in greater benefits; for through the efforts of a number of official and semi-official agencies, more than 20 cities and towns successfully engaged in abatement work. Several miles of channels were opened up to correct obstructed flow in rivers and creeks polluted with sewage from the Chicago area. A number of municipalities raised funds by popular subscription for interior control work. The outstanding feature in mosquito control work this year was the enactment of a law in Illinois providing for creation of abatement districts in communities having a population greater than 300 and for the collection annually of funds by taxation not to exceed one mill on each dollar of taxable property. Application has already been made for one district in the south and three in Cook County, embracing 50-odd municipalities. It is understood to be the plan that such abatement districts will take over all mosquito control work within their respective boundaries.

Texas—Of the 254 counties in the state, about 200 have a mosquito problem with approximately 100 of these reporting malaria. The state authorities are confronted with the problem of spreading control work over a very large area at an increased per capita cost. Systematic control is conducted in some 130 towns, though not all have full-time programs. To those towns which have previously had control operations functioning, the state authorities give only certain supervision and assistance in reviving intensive field work during the mosquito breeding season. Under this limited plan the state health department is enabled to extend its field of operation. Much has been done to eliminate mosquitoes and malaria in certain areas of concentrated population, but little has been done in rural sections. Control operations along the Mexican border have been continued by local communities. Organized control work has reached directly and indirectly approximately 2 million people, which is about 40 per cent of the state's population.

Louisiana—Although mosquitoes are present all over the state and certain sections are malarious, it is stated that the mosquito nuisance is less, that there have been no outbreaks of mosquito-borne diseases, and that the malaria rate seems to be continuing a gradual decline. The state health department has continued to make surveys and submit

plans for and cost estimates of control work. As part of the post-flood sanitation program the work of screening 600 homes of known malaria carriers is being carried out. This work is being done at the expense of the American Red Cross and under the direction of the U. S. Public Health Service. Data collected to compare mosquito bars with screens indicated that more than half of the mosquito bars were not mosquito proof. Although screens give greater protection, the cost of using them, based on a 4-year period and as compared to mosquito bars, was found to be about the same.

Mississippi—Three species of *Anopheles* are to be found here, and *Aedes sollicitans* exist along the coast. The receding waters from the flood created innumerable *Anopheles quadrimaculatus* breeding areas. The 22 full-time county health departments have accomplished considerable control work and 4 additional cities have appropriated special funds to engage in abatement work. The state has maintained its system of advising and supervising. With the aid of the American Red Cross and the U. S. Public Health Service, approximately 3400 homes were screened as a part of the flood sanitation program. The outstanding feature this year is the development of increased interest on the part of the citizenry in mosquito control work.

Alabama—Anti-malaria work and the control of pestiferous mosquitoes are regular functions of the 32 county health units which serve 65 per cent of the population. The outstanding feature of the work is the prevention of new foci looking to the time when the old foci will be eliminated and malaria controlled. The permit system for impounding water is a primary tool of control and places the burden on the property owner where it belongs. Failure to secure results brings a revocation of permit.

Railroad Coöperation in Texas, Louisiana, Arkansas and Missouri—The St. Louis-Southwestern Railroad, Missouri Pacific Railroad and the Chicago, Rock Island and Pacific Railroad all extended their malaria control activities in 1927 in these states. A number of communities took advantage of the coöperation offered by the railroads and inaugurated control measures. Engineering personnel of the railroads lent material assistance during the flood period in planning and effecting anti-mosquito campaigns.

California—Data for this year were not received by the committee. Salt marsh mosquitoes exist along the coast and *Anopheles* and *Culex* inland. Malaria is prevalent in the Sacramento Valley. There is every reason to believe that the usual activities of the 17 organized abatement districts continued during the year.

Virginia—In the Eastern section of this state a malaria mosquito

problem exists, and salt marsh mosquito production along the coast remains unabated. Control work, limited almost entirely to the malaria phase, was continued in 27 towns. A study of salt marsh breeding was made in the area of Hampton Roads and a control commission appointed in anticipation of the creation of a district there. At Quantico, dusting with Paris green by airplane was carried on throughout the season.

South Carolina—Anopheles control work was conducted in 4 counties by permanent health units under state supervision, and 7 drainage districts established at the joint expense of the International Health Board and the counties, have been maintained and have proved effective. Financial conditions preclude the establishment of 15 additional drainage districts on which surveys have been made. Coöperation has been established with the state highway authorities for the elimination of borrow pits, and at Bamberg, Paris green dusting by airplane was successfully tested. Impounding water regulations were rigidly enforced. State assistance was given to 23 towns in the control of pestiferous mosquitoes. As an educational measure, lecture courses were established in 3 universities in the state.

North Carolina—Malarious mosquitoes are present in 13 of the eastern counties. Such control work as is done is conducted from the standpoint of disease prevention. Where required, control operations were conducted by county health departments under the supervision of the state. Two counties have been able to report a reduction of malaria of approximately 60 per cent after 3 years' intensive work. A study of the influence of impounding water upon malaria incidence is being conducted by the state.

Georgia—Control work this year by the state comprised service to 40 municipalities and was directed against all species of mosquitoes and toward enforcing regulations relative to the impounding of water.

Florida—Mosquito breeding in the mangrove areas along the east coast received special attention and beach cities gave considerable thought to the curtailment of mosquito production in adjacent areas. The control district of Indian River County spent \$4,000 and supported a bond issue of \$100,000, which however, has not yet been validated. Seventeen cities serving one-quarter of the population of the state engaged in concentrated work with good results. Several marsh areas were transformed into lakes. Three counties engaged in salt water mosquito control work. The women's clubs were active in educational work. Outstanding features include the adoption of machinery for oiling, the arousing of much public interest and coöperation, the adoption of the method of charging cost against land benefited

in some sections, and the elimination of malaria and dengue fevers in Daytona Beach.

New York—The only organized work in the state is confined to sections of Nassau County and New York City and is conducted by the Nassau County Mosquito Extermination Commission and the New York City Board of Health. Control covers the entire county of 307 square miles with 20,000 acres of salt marsh, 2 cities and 50 villages. The outstanding feature of the work is the reduction of malaria from 476 cases in 1916 to an average of 2 cases for the past 6 years and the development of machinery for catch basin spraying. The problem in New York City is principally one of annoyance. Construction of new roads without proper culverts established new breeding places. Oiling operations by truck were extended and a portable pump used for draining most areas which could not be filled.

Connecticut—Interest in mosquito control has increased during the last 2 years, although the problem here is limited to non-disease carrying mosquitoes. Salt marshes in 3 towns were ditched, using both public and private funds, and other acreage previously ditched was maintained either under state supervision or through local assistance. In New Canaan oiling proved satisfactory.

Rhode Island—In 1925 and 1926 the state appropriated \$30,000 per year to be available to municipalities on a 50-50 basis for mosquito control work. However, in 1925, 31 per cent of this amount was withdrawn and in 1926, 23 per cent. This year only \$15,000 was appropriated but nothing was withdrawn. This decrease in expenditures indicates a parallel decrease in sentiment for mosquito control. The State Commissioner of Public Health, believing the problem one worthy of attention, has endeavored to create favorable public sentiment.

Massachusetts—The principal problem in this state is that of salt marsh mosquitoes. The only control work effected in recent years has been that which resulted indirectly from the operations of the Massachusetts Drainage Board which is conducted for the purpose of improving agricultural areas.

Pennsylvania—The problem is reported as being local in nature, of minor importance and handled by local authorities.

Kentucky—The only work carried on this year was in connection with the Mississippi River Flood and consisted of draining and oiling pools. The State Board of Health has been unable to organize anti-mosquito work on account of insufficient personnel.

Tennessee—Malaria problems lie principally in the western part of the state covering an area some 100 miles square. *Culex* are also

found in this and several other sections. Although general mosquito control work was carried on in some 20 cities and towns, malaria control is the principal activity and was conducted on a county-wide basis in 5 of the western counties with the most highly concentrated work in Shelby County. A quantity of oil for use in 3 of those counties flooded by the Mississippi River overflow and some \$5,300 for screening was supplied by the National Red Cross. Activity is also reported in 4 cities in the central part of the state. Paris green dusting and *Gambusia* play an important part in control operations.

Missouri—Malaria is present to some extent in all parts of the state but is an important factor principally in 7 counties in the southeasterly section, which also applies to the pest mosquito. Due to insufficient personnel and funds control plans are developing slowly, the present activities being limited to educational campaigns.

New Mexico—Anopheles are found in only two localities although mosquito breeding is common along the Rio Grande. Malaria prevails in Dona Ana County and in a small section north of Santa Fe. Only one city has undertaken systematic control work with money obtained by popular subscription. Airplane dusting is to be considered next year.

Idaho—Some pool drainage was done by a few cities. Malaria is not a factor.

Maryland—Survey of one summer resort and town was made and oiling operations were conducted in another town. The problem is principally one of pestiferous mosquitoes.

West Virginia—Occasionally there are complaints from communities because of mosquitoes but the causes of such complaints are easily determined and corrected.

Dominion of Canada—Mosquitoes are reported throughout the Dominion and have been found in large numbers in several sections. It appears that malaria is not a factor. The Department of Agriculture is active in control work.

Nova Scotia—No organized control work has been attempted.

New Brunswick—Control measures have been of an incidental nature, such as the drainage of ponds and swamps.

Quebec—In 1926 a swamp in Montreal was given one application of oil, but operations were not entirely effective due to the extent of the problem and the lack of funds. It is understood that this work is to be continued this year.

Ontario—The city of Ottawa made an appropriation in 1926 for preliminary control work by local boards of health. The invasion of mosquitoes from outlying areas somewhat nullified the work. A mix-

ture of oil and caustic soda gave good results and dusting with powdered derris root was found to be effective. A small amount of money was spent for drainage and oiling this year.

Manitoba—The Winnipeg Anti-mosquito Campaign Committee gives coöperation with some other agencies and is carrying on an active and effective control campaign.

Saskatchewan—Health authorities in this province have said that malaria was not considered in their program and therefore control work was not inaugurated by them.

Alberta—At Banff, the Department of Agriculture has been successful in control operations using oil and gambusia. The Provincial Health authorities have done no such work.

British Columbia—In this Province there is a rich agricultural area where spring and summer freshets establish a 14,000-acre breeding area. The Department of Agriculture recommends permanent diking and draining.

GROUP No. 2—States in which the mosquito control problem exists with no control being done:

Kansas—Mosquitoes of the pestiferous species are present but were not so prevalent as when conditions for breeding were more favorable. The State Department of Health has sponsored a mosquito radio talk.

Indiana—Although no organized work is carried on, extensive drainage operations conducted for agricultural purposes and real estate developments have indirectly resulted in good.

Delaware—Mosquitoes of the irritating varieties are present in abundance but the problem of control would embrace 80,000 acres of salt marsh in addition to the usual fresh water breeding places. An educational campaign is contemplated as a preliminary step to active work.

Iowa, Wisconsin, Minnesota, Wyoming—It appears that malaria is not a factor in any of these states and that no organized control work has been instituted.

Oregon—Due to a late high tide, mosquitoes were more abundant this year than usual. There was also a slight increase in the number of cases of malaria although the total was not high. Efforts to secure protective legislation have not been successful.

Washington—It appears that the mosquito problem is not of sufficient weight to merit the expense of control work.

Alaska—Mosquito production in the interior is exceptionally large. The population of the territory is so small in comparison with the area

that control is almost economically impossible. It is understood that there is no malaria problem.

GROUP No. 3—States claiming to have no problem:

Maine, New Hampshire, Vermont, Ohio, Michigan, North Dakota, Montana and Colorado.

GROUP No. 4—States from which data are not available:

Oklahoma, Arkansas—In these two states the records indicate a malaria problem.

South Dakota, Nebraska, Utah, Nevada and Arizona—It is believed that malaria prevails to some extent in some of these areas with more or less trouble from pestiferous mosquitoes.

There has been a marked reduction in mosquito production generally since last year. It appears that there is a decided increase in sentiment for mosquito control work in North America and that such work is being directed more and more against all species of mosquitoes. Machinery is coming into further use in extensive control work and as a means to an end, enabling legislation is being enacted in additional states.

In view of the very encouraging progress recorded the committee limits its recommendations to continuance of progress in this important adjunct of public health engineering: the enlarging of abatement work of a permanent nature; securing the fullest possible coöperation of the public through the formation of state and local anti-mosquito associations, radio publicity, motion pictures, etc.; seeking favorable legislation where none exists and recommending the adoption of appropriate regulations in roadway and other public developments whereby mosquito breeding places will be built-out instead of built-in.

LEWIS E. JACKSON, *Chairman*
H. W. VAN HOVENBERG
E. L. FILBY

F. W. GREEN
J. L. CLARKE

Course in Psychiatric Work

A one-year postgraduate course in welfare work in Germany with mentally abnormal children, open to physicians, teachers, clergymen, and child welfare workers, was to be started on January 1 of this year under the auspices of the German Association for Psychiatric Work among Children. *Zeitschrift für Schulgesundheitspflege*, Leipzig, 12:559, 1927.

Montana's Laboratory for the Study of Insect-Borne Diseases

R. A. COOLEY

Secretary, Montana State Board of Entomology, Bozeman, Mont.

PROBABLY there does not exist another research laboratory like the one of the Montana State Board of Entomology now nearing completion at Hamilton. The field of work as laid down in the Act which created this board in the year 1913, is "to investigate and study the dissemination by insects of diseases among persons and animals, said investigation having for its purpose the eradication and prevention of such diseases," and the new laboratory is designed and equipped, so far as is possible within the available fund, to perform the necessary studies connected with insect-borne diseases. The Act authorizing the erection of this laboratory, signed by Governor Erickson on March 16, 1927, appropriated the sum of \$60,000. The building is a brick faced, reinforced concrete structure of three stories, 40 feet by 66 feet on the ground. A one-story wing 88 feet in length is attached to the west and is designed for the care of stock laboratory animals. The building is made without a basement in order that it may be as sanitary as possible, and to have as few places as possible where insects or rodents may hide away. The construction throughout is such as to avoid cracks and sharp corners. The boiler burns oil and is automatic and certain of the rooms have automatically controlled temperatures. While the building is planned generally for the field of medical entomology, and closely associated lines, it is laid out particularly for the needs immediately before the state. The common wood-tick of the region, *Dermacentor andersoni* Stiles, and the diseases of man and the losses in livestock of which it is the cause, constitute the immediate problem.

The work on Rocky Mountain spotted fever is being conducted under an informal plan of coöperation between the U. S. Public Health Service and the Montana State Board of Entomology. At the present time the U. S. Public Health Service is concerned mainly with a further study of the Spencer-Parker vaccine. This vaccine, made from the bodies of infected ticks, was originated two years ago at the old, improvised laboratory at Hamilton and at the Hygienic Laboratory at Washington, D. C., by the two U. S. Public Health Service workers whose names it bears. It now has been used on about 4,000 persons in Montana, Idaho and Wyoming, with uniformly encouraging results. The U. S. Public Health Service is also giving attention to the study of

the organism of spotted fever, *Dermacentroxenus rickettsi* Wolbach, and other organisms found in ticks; characteristics of the virus of spotted fever, with particular references to differences in ticks and in various laboratory and wild mammals; relationships of the rabbit tick, *Hacmaphysalis leporis-palustris* Packard, in the spotted fever complex, tularemia, and tick paralysis in man and domestic animals. Some years ago the entomologist of the State Experiment Station at Bozeman, in cooperation with Dr. W. D. Hunter, Dr. F. C. Bishopp and Dr. W. V. King of the U. S. Bureau of Entomology at Washington, worked out the life history and host relationships of the wood-tick. Since that time the entomologist of the Board of Entomology has done further work on its biology, particularly with reference to its reactions to temperatures. During the past year the entomologist has been engaged in a study of the French tick parasite, *Ixodiphagus caucurtei* Du Buysson, introduced into Montana with the assistance of Dr. Brumpt and Dr. Larrousse of the University of Paris, and Dr. S. B. Wolbach of the Harvard Medical School of Boston. Particular emphasis is to be given to the work on this parasite during the next few years and an effort will be made to find other parasites, particularly in Africa.

The U. S. Public Health Service is represented in Montana by Dr. R. R. Spencer, officer in charge, and by Entomologist R. R. Parker, Special Expert. The State Board of Entomology is *ex officio* and composed of Dr. W. F. Cogswell, Secretary of the State Board of Health, *Chairman*; Dr. W. J. Butler, State Veterinary Surgeon, *Member*, and R. A. Cooley, State Entomologist, *Secretary*.

A feature of the spotted fever studies in Montana is that they are planned and carried out with careful reference to field conditions. It is for this reason that the new laboratory was erected at Hamilton in close proximity to regions where Rocky Mountain spotted fever is found. Field conditions may be thus easily studied, materials for study may be brought in, and parasites may be bred and quickly liberated.

Laboratory work on spotted fever has always been dangerous for the workers. Up to the time that the Spencer-Parker vaccine was developed there had been 4 cases of laboratory infection with the disease in Montana (3 at the field laboratories and 1 in Helena). All of these cases were fatal. Since we have had the vaccine there have been 7 laboratory cases and 6 of these have recovered. It is now indicated that the vaccine gives full protection against all strains of the disease excepting the more virulent one in the region near the laboratory, and sufficient protection in the majority of cases to insure recovery from infection with the more virulent strains. It is hoped the new laboratory with its modern conveniences will afford much better protection for the

workers than was possible in the one being abandoned which was a vacated schoolhouse.

The new building provides an incinerator for the disposal of dead animals and all waste; a specially adapted laundry and drying equipment for the cleaning and drying of the numerous cloth bags used to confine the ticks on laboratory animals; dressing, locker and shower rooms for the use of workers, who are expected to make a change of clothing on coming from the field and on leaving the laboratory; a shop for the making of cages and other equipment; a poison room for mixing and drying poisoned grain to be used in the destruction of certain rodents; and quarters for the custodian. A special feature of the equipment is a series of three refrigerator rooms cooled by a Frick ammonia machine. These rooms are cork walled and are automatically maintained at 40° C., 40° C. and 0° C. respectively. In these rooms are fifteen thermal cabinets automatically maintained at graded temperatures ranging from 0° C. to 37° C. These cabinets will be put to a variety of uses including storage and incubation of cultures, virus, and vaccine, and experimental work on ticks and parasites.

During the season of 1928 we hope to rear and liberate at least 1,500,000 parasites, which involves the holding of a large number of parasitized ticks, and we have found that within certain limits we can bring them out when we want them by varying the holding temperature.

The building provides several rooms in which laboratory animals such as guinea pigs and rabbits, and wild rodents such as ground squirrels, mountain rats and wild rabbits of various kinds, will be held in cages stacked in steel frames. The production of vaccine in quantity involves the feeding of a very large number of infected ticks, as well as numerous tests on guinea pigs. Many of the experiments on the virus and the studies of the organisms require the use of laboratory animals. In the parasite work it is necessary not only to parasitize the ticks while they are on animals but also to rear the ticks which are to be parasitized. To prove that parasites have been established in the experimental field areas and determine the percentage of parasitized ticks, wild rodents must be trapped and held in cages until the ticks drop off.

It is thus necessary to hold a very large number of animals in cages in the screened and guarded laboratories. This requires the daily feeding of animals, often the taking of their temperatures, and at all times the keeping of the cages and rooms in a clean and sanitary condition.

There are also provided two general laboratories equipped with facilities for chemical and bacteriological studies. For the grinding of infected ticks and further preparation of the vaccine, a special room with suitable facilities is provided. There are also furnished office and

record rooms and a photographic room. The rabbit hutches in the animal wing deserve special mention as they are made in keeping with the established practice of rabbit breeders in the Northwest. These hutches are built in four tiers facing a hollow square or court. While the four walls of the building are complete, the roof is left off in the portion over the court thus practically exposing the animals to the open air, which exposure growers have found keeps rabbits in a healthier condition. The guinea pig room is of tighter construction and is given a small amount of heat. A root cellar is under this room.

Rocky Mountain spotted fever occurs, in addition to Montana, in the following states: Idaho, Wyoming, Utah, Colorado, California, Nevada, Washington, Oregon, North Dakota and South Dakota. In spite of this general distribution in the Northwest the people of the United States rather generally look upon the disease as being peculiar to Montana. This is due to the fact that most of the investigations have been conducted in Montana, and also to the fact that there exists an area in western Montana where the disease is more virulent and fatal than elsewhere. In western Montana, particularly, spotted fever has been looked upon as a "mystery disease." The brilliant work of Dr. H. T. Ricketts removed some of this mystery and pointed the way for further study. The excellent work now being done by the U. S. Public Health Service is further explaining the peculiarities of the disease.

Including the highly trained specialists and their helpers, in this country and in other countries, there have been 7 deaths from laboratory infection with the Rocky Mountain spotted fever. This is probably a record. These deaths have contributed an air of romance to the disease and popular writers have found spotted fever in Montana a fertile subject. Much or most of what has been written is true if taken as separate statements. But selected statements set forth without telling all of the facts, and made in highly colored language, have created a false impression, which is hurting the State of Montana both in its reputation as a place of residence and also economically.

The Board of Entomology has pursued a policy of fearless truth telling, believing this to be the best way to overcome an unreasonable fear that some persons seem to have. Spotted fever does occur in Montana rather generally though there is a small total of cases. There were 36 in 1927, and this number compares favorably with many other diseases. Ticks are common in many parts of Montana but ticks are common in places all the way through to the Atlantic Ocean.

The State of Montana expects to continue its studies of the tick and spotted fever and the new laboratory here described may be taken as an earnest of the state's desire to remedy the situation which exists.

Pathology, Prophylaxis and Treatment of Subtertian Malaria

IAN MACKENZIE, M. D.

International Petroleum Company, Ltd., Peru

THE report embodied in this paper is based on the detailed examination of 1150 cases, and covers a period of 9 years. The early experiments were carried out in Sierra Leone during 1916 to 1918, at the instigation of Sir Ronald Ross, but the exigencies of war service made consecutive work difficult, while the influenza epidemic of September, 1918, broke the continuity of many of the experiments. The investigations were continued in the West Indies and in Venezuela.

Little that is new in our knowledge of the disease is claimed for this report, but accuracy of experiment and observation has been the aim throughout, and the correlation of symptoms with laboratory findings may prove of interest.

Three problems interested us at the outset:

1. The value of quinine in prophylaxis
2. The biological properties of the gamete
3. The causes of the changes in certain essential organs, giving rise to the syndrome called the pernicious attack

The solution to these important questions might suggest a rational form of treatment whereby localization of the disease to one or more organs could be prevented, or if present, relieved. The organisms were studied in hanging-drop and fixed preparations, and the polychrome stains employed were those of Senevet and Wright's modification of Leishman's method.

From various groups, at different times and in different localities, new arrivals in the tropics, and numbering 627, the following observations were made:

1. Red blood count
2. Hemoglobin index
3. Absolute and Differential Leucocyte count
4. Blood Pressure
5. Coagulation time of the Blood
6. Urine Examination

These were divided into three batches:

NOTE: Acknowledgment is made of the invaluable assistance of the noncommissioned officers and men of the R. A. M. C., Tower Hill, in the collecting and staining of blood films; especially are my thanks due to Sergeant Trehearne and Corporal Williams, whose enthusiasm and practical ability made possible what turned out to be a difficult and painstaking task.

On admission to hospital or clinic, the observations on the blood and urine were repeated, and continued every 2 days until the patient's discharge. Additional notes made included:

Localization of symptoms
Duration of pyrexia
Enlargement of spleen
Increase in large mononuclears

Table I represents a typical record sheet, while Tables II to IX, summarize the results obtained in the whole series (1150).

TABLE II
Blood Pressure

		Per cent
1. No fall	(83)	8
2. 5-10mm.	(105)	9
3. 10-15mm.	(220)	19
4. 15-20mm.	(474)	41
5. 20-25mm.	(163)	14
6. 25-30mm.	(69)	6
7. Over 30mm.	(36)	3

TABLE III
Red Blood Count
Loss

		Per cent
1. Under $\frac{1}{2}$ million	(46)	4
2. $\frac{1}{2}$ -1 million	(356)	31
3. 1-2 millions	(506)	44
4. 2-3 millions	(207)	18
5. Over 3 millions	(35)	3

TABLE IV
Leucocyte Count

		Per cent
1. Persistent Leucocytosis	(80)	7
2. Leucocytosis, followed by leucopenia	(817)	71
3. Leucopenia from outset	(253)	22
Relative and absolute increase of large mononuclears	(494)	43

TABLE V
Hemoglobin Index

		Per cent
8	(276)	24
7	(437)	38
.6	(264)	23
5	(173)	15
and under.		

TABLE VI
Urine (albumen)

		Per cent
1. No albumen	(836)	73
2. Trace	(184)	16
3. $\frac{1}{2}$ -1 per cent	(81)	7
4. 1-2 per cent	(31)	2.7
5. Persistent	(18)	1.6

TABLE VII
Duration of Pyrexia

		Per cent
1. Under 24 hours	(35)	3
2. 24-36 hours	(218)	19
3. 36-48 hours	(242)	21
4. 48-60 hours	(368)	32
5. 60-72 hours	(161)	14
6. Over 72 hours	(126)	11

TABLE VIII
Splenic Enlargement

		Per cent
1. Not palpable	(264)	23
2. Palpable during paroxysms	(828)	72
3. Persistent enlargement	(58)	5

TABLE IX
Localization Signs

1. Gastrointestinal	(125)	11 per cent
(a) Dyspepsia	(56)	
(b) Pseudo-dysentery	(49)	
(c) Cholecystitic	(11)	
(d) Choleraic	(7)	
(e) Appendicular	(2)	
2. Skin	(125)	11 per cent
(a) Herpes Labialis	(47)	
(b) Hyperpigmentation	(61)	
(c) Diffuse Erythema	(14)	
(d) Purpura	(3)	
3. Cerebral	(73)	6.3 per cent
(a) Delusions	(32)	
(b) Polyneuritis	(13)	
(c) Comatose	(11)	
(d) Meningitic	(8)	
(e) Mental	(4)	
(f) Cerebellar	(3)	
(g) Hemiplegic	(2)	
4. Urogenital	(42)	3.6 per cent
(a) Malarial Hemoglobinuria	(22)	
(b) Nephritis	(18)	
(c) Orchitis	(2)	
5. Circulatory	(29)	2.5 per cent
(a) Tachycardia	(19)	
(b) Arrhythmia	(8)	
(c) Anginal	(2)	

Examination of these record cards brings out the following points:

1. Anemia is marked and progressive during the first week of the attack, but as a rule recovery in new cases is prompt.

2. The blood pressure, at some period of the paroxysm, is lowered almost invariably. There is a marked relationship between a low blood pressure and localization of symptoms.

3. After a preliminary leucocytosis, leucopenia is the rule, and in the majority of the readmissions there is a relative and absolute increase in the large mononuclears.

4. The coagulation time of the blood is sometimes increased, sometimes unaffected, and more rarely decreased.

5. In the majority of the cases rigors are not marked.

6. The temperature charts are very irregular in first attacks, but become more frankly intermittent in the relapses.

7. The rate of hemolysis is less marked in the relapse, although the anemia is as a rule more profound.

8. Where quinine prophylaxis (gr. 5) daily has been given, the clinical symptoms of an attack are often more intense, and the immediate reaction to quinine less effective than when no prophylaxis is employed. This is more noticeable in first attacks.

9. The addition of iron and arsenic to the prophylactic quinine, although it did not materially decrease the number of admissions, diminished the amount of anemia associated with the attack.

10. In areas where malaria infected mosquitoes are numerous, quinine in 5 gr. doses is insufficient to prevent an attack. By doubling the daily dose the incidence is much reduced (40 per cent less in one locality).

11. Quinine treatment by the mouth, provided there is no vomiting, seems to be as efficacious as by any other route.

12. The more marked the anemia the greater the tendency to localization of symptoms.

In order to determine whether the prophylactic doses of quinine or the much larger therapeutic doses would of themselves produce anemia, 10 volunteers, none of whom had suffered from or were exposed to malaria, were given 30 gr. of quinine a day for 3 weeks. In no case did this dose have any hemolytic effect.

The increased coagulation time of the blood suggested that a calcium salt might be a useful adjunct in treatment, but experiments carried out after the administration of large doses of calcium chloride produced no effect whatever either on the coagulation time or on the general condition of the patient.

The lowered blood pressure, combined with the post-mortem findings in the viscera of malarial cases, in which small infarcts were frequently present, suggested that good results might follow by raising temporarily the blood pressure with a view to dilating the capillary vessels, and so preventing or reducing this blocking and concentration of toxins. The intravenous injection of large quantities of isotonic

saline in some of the more severe pernicious cases seemed to be efficacious, but better results were obtained by infusing a saline solution containing an osmotically active colloid, such as gum acacia. To these solutions quinine in varying doses was added (10-20 gr.). In a few of the cases the temperature dropped in the course of a few hours and did not rise again; in others, localization symptoms disappeared rapidly after the injection.

Turning now to the biological properties of the gamete, Schaudin's speculation that the relapse in malaria was due to parthenogenesis, the macrogametes being converted into schizonts and then starting a new asexual cycle, seemed plausible. But the evidence given below tends to support the view of Sir Ronald Ross that the parasites are capable of survival for long periods in the viscera, and that a partial immunity exists which, under certain conditions such as fatigue, excesses etc., is broken down.

As late as 1918, the authors of *Malaria in Macedonia* summed up their conception of the rôle of the gamete as follows:

The hematozoan also gives rise to certain elements whose rôle is all important, known as gametes (sexual form). These elements are formed at the expense of the schizonts and ameboid bodies, which instead of dividing into rosette bodies, become transformed into a body which is either rounded (in *Plasmodium vivax* and *Plasmodium malariae*) or falciform (in *Plasmodium Falciparum*), and is soon set free in the circulation. This body, which is the gamete, possesses two extremely important biological properties. In the first place, it is responsible for the chronicity of malaria in the human organism, and secondly, it is the cause of the persistence of malarial epidemics throughout the globe. The gamete is extremely resistant to quinine, while the vegetative forms (schizonts, ameboid bodies and rosette bodies) are destroyed by the drug, the gametes may persist in the organism for months or years. Now under certain conditions, when the organic resistance gives way, under the influence of fatigue or meteorological circumstances, the gametes, which had hitherto remained quiescent, like parasitic cysts, begin to divide, and by multiplication of their nuclei give rise to rosette bodies, the rupture of which sets free the merozoites. The latter at once attack the red corpuscles, increase in size and number and the ordinary cycle of schizogony is reproduced. This special process of segmentation is called parthenogenesis of the gametes. This is the ordinary process in relapses in malaria. It can easily be understood that so long as these special elements persist in the organism, the patient is exposed to a relapse, and it is in this sense that it may be said that the gamete, and the gamete only, keeps up the chronicity of the disease.

The evidence for these conclusions seems to me unsatisfactory. My researches into this problem resulted as follows:

1. Despite Karrawy's observation that he found parthenogenesis to occur in *Plasmodium vivax* at the height of the paroxysm, most careful examination of thousands of films and hanging-drop preparations in a large number of malarial cases, has failed in every instance to show anything suggestive of retrogressive schizogony. When gametes existed in the peripheral circulation, a double infection

of a corpuscle with a schizont and a gametocyte was not infrequently observed.

2. Post-mortem examination of smears from the viscera—spleen, liver, brain, bone-marrow—in cases known to be free from the clinical manifestations of malaria for at least 3 months before death, but all of whom were chronic malaria subjects, showed the capillaries filled with blood containing parasites and leucocytes with pigment; the red cells of the splenic pulp contained schizonts and crescents.

3. Provocative attacks of malaria were produced by the intravenous injection of adrenalin in 3 out of 6 cases whose peripheral circulation showed an excess of large mononuclears and pigmented leucocytes, but no plasmodia.

4. Splenic puncture in 10 cases with moderately enlarged spleens, in whom the clinical manifestations of malaria were absent, and crescents only could be found in peripheral blood, demonstrated the presence of sporulating forms on the films of 6.

5. A Syrian was admitted into hospital with amebic dysentery. On examination, his blood was found to be swarming with crescents, and in spite of prolonged examination of more than 100 films, no plasmodia could be discovered. There had been no clinical evidence of malaria for many months. By means of a Pravaz syringe, blood from this subject was injected directly into the basilic veins of 5 members of his family who lent themselves for the experiment, in quantities of 1 c.c., 2 c.c., 4 c.c., 6 c.c., and 8 c.c. In no case did these injections produce an attack of malaria. Sometime later, 0.5 c.c. of blood containing plasmodia from a case of sub-tertian malaria was injected into this Syrian. Within 10 days he was readmitted with a typical paroxysm, his blood swarming with plasmodia. Finally, 0.5 c.c. of his blood, containing the plasmodia, was injected into the members of his family previously inoculated with crescents. Four out of the 5 developed an attack within 2 weeks.

While the series of experiments and observations just described cannot be considered as conclusive evidence against parthenogenesis, I submit that they are sufficiently suggestive to make us hesitate before accepting Schaudin's view.

Of the fact that quinine in sufficient dosage kills the crescents in time, there can be no doubt. In one series of cases, 109 natives, whose peripheral blood showed numerous crescents but no plasmodia, were given 30 gr. of quinine a day with the following results:

Shortest time required for disappearance of crescents—5 days
Longest time for their disappearance—28 days
Average time required—17.5 days

Safe Water for Tourists

MICHIGAN began its annual roadside water survey earlier this year than usual so that tourists will be safeguarded against polluted and contaminated water and the safe water supplies will be posted before the tourist season is in full swing. Two men are sent out to collect samples of water which are sent to the state laboratory for analysis. A third man is sent out a couple of weeks later to post the supplies and safe up an analysis with a "Safe Water" sign.

Carrying Health from the Clinic to the Community

ESTHER JACOBS

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THE Health Extension Department of the Community Health Center of Philadelphia, in its effort to develop a health program that would reach and interest a variety of groups throughout the community, has had a very interesting experience. Our aim is to give a working knowledge of fundamental health rules for everyday use and to stress the preventive side of health work.

The Community Health Center, supported by the Federation of Jewish Charities, was organized in 1921, upon the recommendation of Michael Davis, Ph.D., after he had made a survey of the medical resources within the Federation. It is located in the same building which houses several large case work agencies of the Federation. The Community Health Center functions as a health clearing bureau for the social agencies of the Federation, whose clients come to it for complete physical and mental examinations, as well as dental care.

All examinations are made by appointment through the agency sending the clients. Before the examination the health center receives from the agency a history of the family, in addition to the social and health record of each individual to be examined. With these facts for reference the necessary laboratory tests and examinations are made. Finally, a full report of the examination, together with definite recommendations, is sent to the agency. In the Mental Hygiene Department we include psychological, psychiatric and child habit clinics.

The examining staff is composed of salaried specialists working part of the day at the Community Health Center. There are 4 physicians (2 men and 2 women), 1 psychologist, 2 psychiatrists, 1 clinical pathologist, and 2 dentists. In addition, a psychiatric social worker, a nutrition worker, an oral hygienist and adequate clinical and laboratory assistants and a clerical staff give full time. There is also a volunteer staff of clinical secretaries and clerical workers.

The health instruction and teaching is given first by the physician during the examination and is supplemented by the health center social worker, who also explains the recommendations made by the doctor. This is further followed up by the agency worker who is originally

responsible for referring the patient to us, and who (since our medical work is diagnostic in character) also does the refer and follow-up work through existing resources of hospitals, dispensaries, and private physicians. A food demonstration is held during clinic hours once a week. One nutritious dish is selected from the daily menu chart and prepared in the clinic, recipes in English and Yiddish distributed, and the food served to all the mothers and children present at the time.

In our health extension program we tried to cover as many sections of the city as possible and to organize groups of different types in each section. We succeeded in reaching the following groups:

A Yiddish speaking Mothers' Club, with an average attendance of 35. The importance of, planning, preparing and serving well balanced meals was discussed. Colored charts were used to illustrate menus, and recipes in English and Yiddish distributed.

Two groups of working girls in different sections of the city were interested. One, a group of 12, was organized as a weekly Supper Club. A course meal at a minimum cost of 25 cents each was prepared by the girls. Each member was responsible for some part of the evening's program. Not only was this an opportunity to teach how to prepare a well balanced meal and how to serve it, but the duties and courtesies desirable in a hostess were explained. Once a month there was, as an invited guest to dinner, a specialist in some field of health work. Thus, care of the teeth, good posture, personal hygiene were each in turn discussed. When the group disbanded for the season complete physical examinations were made, at the Community Health Center and in some instances by private physicians, and defects corrected. In one instance a psychiatric study was deemed necessary.

The second group, which met monthly, consisted of all the girls in the clubs of one of our settlements. There was an average attendance of over 100 girls from 16 to 20 years of age. Notices of the meetings were usually posted in advance as talks on "Charm and Beauty," "How to Dress," "Etiquette," etc. Through these topics health discussion was stimulated, resulting in definite questions regarding individual health problems and the advantages of health examinations, and in some instances voluntary requests for complete physical examinations.

A Health Story Hour in one of the playgrounds is held weekly. This is a mixed group of white and colored, the former usually of foreign born parents. The age group is between 6 and 10 years, and the average attendance over 60 children. It is remarkable to hear the health story repeated by the children the week after its presentation by the worker, and to realize how they have absorbed definite health rules presented in this fashion. Several mothers came voluntarily to meet the

“teacher” and tell just how the children were trying to live up to health rules.

A Health and First Aid Club is held weekly in one of the Hebrew schools. The group consists of 15 adolescent girls, 13 to 16 years old. Upon the request of the girls several sessions were devoted to sex education. One meeting was devoted to general discussion, after which the girls wrote their questions and placed them in a box for the worker to answer at the following meetings. Later the mothers of two of the girls personally thanked the worker, saying that they were grateful for the instruction that had been given since they themselves had been unable to discuss the subject with their daughters. These children not only come from the better type homes where parents are interested and coöperative, but mingle with a like group, and through their interest and activities in the club spread health thoughts and rules to a group we probably would never reach otherwise.

Recently a posture class for a limited group of children from 8 to 13 years, referred from our clinics, has been organized, and two pre-school groups in nursery schools are taken over one period a week by the health worker. Mothers of these children have formed a Mothers' Club.

During health week special programs were arranged for each group and we succeeded in inaugurating periodic health examinations for the members of the staffs of the organizations housed in the building, except where individuals were already under the care of private physicians.

In the past 6 months we have reached an average of over 300 individuals outside of the health center each month through the various clubs, classes and lectures. These are in addition to those coming to our medical, mental and dental clinics for original and reëxaminations. We have examined 4,895 in our Medical Department, 1,404 in our Mental Department, and have given dental care to 6,182 during the past year. It is not, of course, possible to estimate the number reached indirectly through the extension work. Requests for a continuation of the clubs and classes have been made and we are encouraged by the thought that health information has been spread and taught through the various activities and are considered of sufficient value to be continued.

Incidence of Tuberculous Infection in Children from Rural Districts*

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UNTIL 1924 when Slater reported the results of the von Pirquet tuberculin test on children in a rural community in Minnesota, all of the statistics on the percentage of positive tuberculin reactions in children were compiled from data from clinics in the large cities of this country and Europe. Slater reported only 10 per cent of positive reactions as compared with 50 to 80 per cent of positive reactions reported by continental clinics and clinics in New York City.

The question arises whether any of these figures can be accepted as representative of the percentage of children giving a positive reaction to tuberculin, because in one case the tests were given only to children living in a healthy, wealthy rural community where the incidence of tuberculosis was low and the danger of infection slight, and in the others to children from the large cities, generally from the poorer, congested districts where there was obviously greater opportunity for tuberculous infection to occur.

At the Mayo Clinic we have an opportunity of examining children from many different sections of the country and from all types of environment. Since a tuberculin test is done as a routine in the case of every child who registers in the Section on Pediatrics, it might be valuable to collect data on the results of tuberculin tests from a larger group, geographically speaking, than is covered by any of the data available at the present time.

This study was made to determine the results of tuberculin tests on children coming from rural and semi-rural districts. The results reported were collected from a study of the histories of 1000 children between the ages of 6 months and 15 years, living in communities with a population of less than 25,000 and coming from 35 states, Porto Rico, Mexico, and Canada. All cases in which there was any evidence of active tubercular lesions were excluded.

In the 1000 cases there were 169 (16.9 per cent) in which the tuberculin reaction was positive: There were 532 boys, and of these 15 per cent gave positive reactions; 468 were girls and of these 19 per

*Presented at a meeting of the Northwest Pediatric Society, Rochester, Minn., July 16, 1927.

cent gave positive reactions. Table I shows the results of the 1000 tests with the number and percentage of positive reactions according to age groups. A study of this table will show that there was a slightly higher percentage of positive reactions among the girls. Except for 3 girls aged 1 year, no positive reactions were recorded for children less than 2 years of age. While there was no striking increase in the percentage of positive reactions with the increase in age, the percentage of positive reactions among girls from 2 to 5 years of age was greater than among the boys of that age, and this balance persisted throughout the series. Slater reported practically the same observations.

TABLE I

POSITIVE REACTIONS IN THE DIFFERENT AGE GROUPS

Age, years	Boys			Girls		
	Cases examined	Positive Reaction Cases	Per Cent	Cases examined	Positive Reactions Cases	Reactions Per cent
0.5-2	21			13	3	23.0
2-5	110	11	10.0	99	13	13.1
5-10	220	36	16.3	186	32	17.2
10-15	181	33	18.2	170	41	24.1
Total	532	80	15.0	468	89	19.0

TABLE II

ANALYSIS OF CASE HISTORIES OF PATIENTS WITH POSITIVE REACTIONS

	Boys		Girls	
	Cases	Per Cent	Cases	Per Cent
Positive reactions	80	15.0	89	19.0
History of exposure	8	10.0	7	7.8
Family history of tuberculosis	16	20.0	17	19.1
No history of tuberculosis or contact	56	70.0	65	73.1
Overweight (5 per cent or more)	14	17.5	12	13.4
Underweight (5 per cent or more)	28	35.0	40	44.9
Changes in lungs in roentgenogram	15	18.7	19	21.3
Types of changes in lungs				
Calcified lymph nodes	8		13	
Bronchial thickening	5		4	
Fibrosis	1			
Infiltration	1			
Healed tuberculosis			2	

Data collected from the case histories of the patients with positive tuberculin tests are shown in Table II. It will be seen that only 8.8 per cent gave a history of known contact, whereas 19.5 per cent gave a family history of tuberculosis. Fifteen per cent of the patients were 5 per cent or more overweight and 40 per cent were underweight. The difference here is marked enough to make one attach more significance to the positive tuberculin reaction in the underweight than in the overweight child. Changes were visible in the roentgenogram of the chest in 20 per cent of the patients. The changes in the lung most

frequently found were calcified lymph nodes and bronchial thickening, neither of which necessarily indicates tuberculosis.

Family history of tuberculosis with no known tuberculous contact was shown in 124 cases of the 1000 examined. Of the 60 boys in the group of 124, 16 (26.6 per cent) gave positive reactions, and of the 64 girls, 17 (26.5 per cent) gave positive reactions. This seemed to indicate that among children with a family history of tuberculosis there is a slightly greater percentage of tuberculous infection than among children from families free from tuberculosis.

Thirty-three patients gave a history of tuberculous contact. Fifteen of these were boys, and of these 10 (66.6 per cent) gave positive reactions; 18 were girls and 9 (50 per cent) gave positive reactions. The high percentage of positive reactions occurring in children who had tuberculous contact, as compared with the percentage in children without tuberculous contact, has been commented on by all who have studied tuberculin reactions in the various groups.

In the 1000 cases there were 144 in which there was some evidence of pulmonary changes on roentgenologic examination of the chest. Seventy-five of these patients were boys and 16 (21.3 per cent) had given positive tuberculin reactions; 69 were girls and 20 (28.9 per cent) had given positive reactions. These figures suggest the possibility of a definite relation between positive roentgenologic findings and tuberculous infections in children.

In considering the accuracy of the results in this report there are several points which must not be overlooked. First, practically all the results reported are of the von Pirquet test which is applied by the burr method on the flexor surface of the forearm. The readings are taken 24 and 48 hours later. The Mantoux test, which has been shown to be much more significant for certain purposes, is used only in cases in which there is reason to suspect tuberculosis, and it is necessary to exclude a tuberculous infection as soon as possible. Second, the tests were made and read by different doctors and allowances must be made for individual variations in interpreting the results. Third, with few exceptions the results were reported after only one test. The importance of repeated tests in determining positive reactions is being emphasized more and more because there is a negative reaction following a first test in a certain percentage of noncachectic persons with known tuberculous infections, but the reaction is positive when the test is repeated.

In our records there are several cases in which the von Pirquet test was negative but because the physical examination or history suggested the possibility of a tuberculous infection the tuberculin test was later

TABLE III

COMPARISON OF POSITIVE REACTIONS IN VARIOUS SERIES

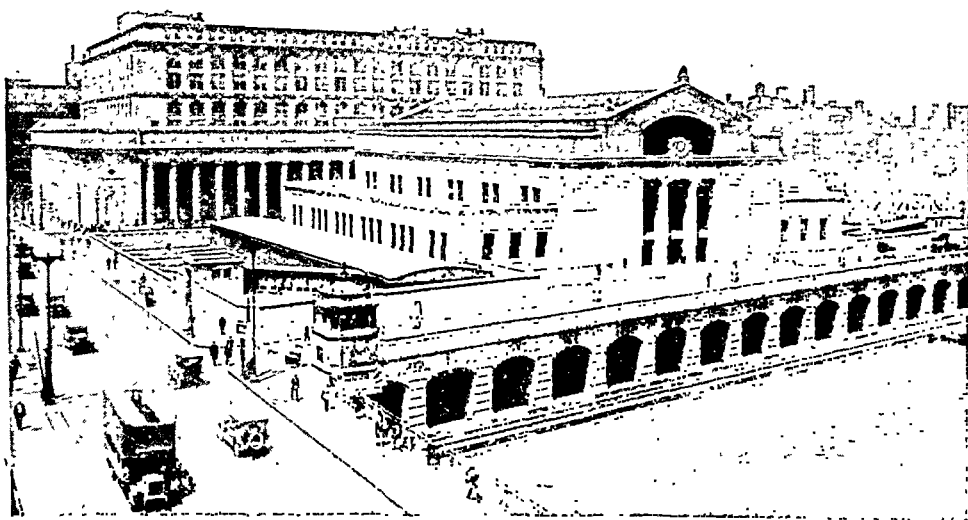
	Slater, per cent	Green and Forbes, per cent	Mayo Clinic, per cent
Entire group	10.0	45.2	17.0
With contact	81.0	64.0	58.8
Without contact	5.3	19.4	6.0

repeated by the Mantoux method. Sometimes a positive reaction was not obtained until a second Mantoux test was given or the amount of tuberculin was increased.

In conclusion, attention is drawn to the fact that our results are comparable to those of Slater, and of Green and Forbes who reported the results of tuberculin reactions in children in rural and semi-rural districts near Denver, the results being classified according to whether the children had or had not been in contact with tuberculosis (Table III).

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NEW UNION STATION, CHICAGO

The Importance of Proper Training for Sanitary Inspectors*

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THE Sanitary Inspectors Association of Canada has done a great deal to improve the status of the sanitary inspector—first, by affording opportunities for the members to increase their knowledge and usefulness, and second, by helping to remove that notion, once so prevalent that any uneducated Tom, Dick or Harry was good enough for a sanitary inspector.

However, in Canada we still have a long way to travel before the inspector comes into his own.

We have to convince quite a number of the sanitary inspectors themselves that in these days when public health work is progressing by leaps and bounds, and when new discoveries in the conquest of disease are being made almost every year, that a person taking up public health work in any of its branches cannot be content with mere routine work, but that he or she must be of a studious nature, prepared to keep abreast of this rapid progress—to know about the new discoveries, and to apply them in his daily work. We also need to convince quite a number of inspectors of the advantage of belonging to an association such as this, which exists for the benefit of sanitary inspectors and other health workers.

Next, we want the support of the health officers. We want to show them how much better work they will be able to accomplish when all public health workers are properly educated and trained.

We also need to convince governmental and municipal authorities who employ sanitary inspectors and other health workers that they can get better value for their money by insisting on proper qualifications for such workers.

Lastly, we seek to show the general public with whom we come in contact so much, that the sanitary inspector is not a raw man pitchforked into a public position by means of some "pull," but a man specially educated and trained for his particular work.

What is a sanitary inspector, and what are his duties? In the first place we note a great diversity in these duties. H. P. Boulnois, late

*The following is a paper presented at the Annual Convention of The Sanitary Inspectors Association of Canada, held at Winnipeg, Man., in 1910.

Engineering Inspector of the Local Government Board, England, once had this to say on the matter:

In order to carry out the multifarious duties of his office, an inspector should be partially educated in the following trades and professions: That of a *plumber*, in order to detect bad work, and to be able to specify in his notices how the bad work is to be rectified. That of a *builder*, in order to detect improper sanitary construction, and state how it must be remedied. This is of greater importance where, as in some towns, the sanitary inspector has to carry out the duties of a building inspector, and watch the erection of new houses which are being erected under the by-laws regulating new buildings. That of a *butcher*, in order to detect and intercept bad meat. That of a *veterinary surgeon*, in order to observe animals that may be suffering under the Contagious Diseases (Animals) Act, and also in connection with his visits to slaughter-houses. That of a *lawyer*, in order that he may be well cognizant with all the Acts and Regulations under which he carries out his duties, and to enable him to form a judicial opinion upon all statements and facts. That of an *architect*, in order that he may understand plans, and if necessary, make sketches of anything that comes under his notice in connection with his duties. That of a *clergyman*, in order that he may preach the good tidings of sanitation, and may by his precept and example further the good work he is engaged upon, and also that he may be able to patiently bear the abuse which he may sometimes receive for what is called his "prying interference." Lastly, he must try and educate himself in *common sense*, that most valuable commodity, without which book learning availeth not much.

A few extracts from Taylor's *Sanitary Inspector's Handbook* may not be out of place here:

To carry out his duties efficiently, the sanitary inspector must exercise great forbearance, tact and good temper; sometimes technical objections will be raised to his proceedings, vexatious delay and evasions will often occur in the fulfilment of his notices, nuisances which the officer is anxious to suppress may elude his authority; when he would force one person to refrain from tainting the atmosphere with the result of an offensive trade, where he would oblige another to see that his tenants were better housed than cattle, he will often be reminded of the rights of property and of an Englishman's inviolable claim to do as he will with his own. With private affairs he should interfere only when they become of public import, and with private liberty only when it becomes a public encroachment.

Thus neither the personality nor the office should be magnified. To do this is to court the contempt of ordinary men and women. Officialdom is the curse of any administrative body. Therefore the man who goes about his duties in a way that compels respect, and whose tactful demeanour impresses others that the thing he is asking for cannot be denied, is the one who will win his way to the front. Owners and occupiers are but human, and they like to feel that they are receiving the attention of a friend, although an official.

And again speaking of qualifications:

Sanitary authorities do not and have not always sought to appoint the person best fitted for the post of inspector. They have too frequently appointed the man who could command the greatest influence with its members without the slightest regard to his qualifications. The important duties which sanitary inspectors are now called upon to discharge, and the large discretionary power that must be vested in them, demands that only qualified persons should receive these appoint-

all certificates granted. I know that this offer has been made in Manitoba. It should be noted that the certificate of the Joint Examination Board in England will be harder to get than the old one, mainly because a much higher standard of preliminary education is required of the candidates. Some secondary education is also insisted upon. Candidates in addition to this must have attended a 6 months' course and also have received practical training in a public health department of lectures and demonstrations at an institute recognized by the board, for at least 300 working hours during a period of 1 year. The Ministry of Health is making arrangements with municipalities for the giving of this training.

This is a very brief description of the new regulations, but it indicates a movement toward a much higher standard for sanitary inspectors in England and Wales. New Zealand and Australia are moving in the same direction. What about Canada? Outside of the Province of Saskatchewan and the City of Winnipeg, I know of no place where the obtaining of a certificate is required as a precedent to appointment. Surely now that Canada ranks as a nation, we should not be satisfied with anything but the best. One of the main objects of our association is to promote the knowledge of sanitary science. How can we do this if we ourselves have not that knowledge?

One of the difficulties in this new country has been the lack of courses of lectures for sanitary inspectors, and of opportunity for gaining practical knowledge. The universities should provide the necessary classes. Practical training might be obtained by students in acting as voluntary part-time helpers in health departments. All, however, might not be able to get to the university centers, but in the larger cities private classes under a good tutor can accomplish much. This method has been very successful in Winnipeg. But even isolated students should not despair, for many students have prepared themselves for examination by private study. A course of lectures or a class held for students studying for examination, should be quite different from a short course of lectures intended for inspectors holding official positions. In the first instance the student has to begin with the elements of the sciences, such as arithmetic, mensuration, geometry, physics, chemistry, etc., before commencing to consider the application of these to sanitation. The period of study must cover a fairly long interval. The short courses on the other hand are intended for practical men already knowing a good deal about the subjects dealt with, but anxious to acquire the latest and best information. Examples of the latter may be found in the lectures and demonstrations provided in England by the Royal Sanitary Institute, or by the courses in dairy inspection now

being given in England as arranged for by the Ministry of Health.

Our association stands for the enactment of legislation in all the provinces which will require, in the case of future appointments to the position of sanitary inspector, a qualifying certificate from some recognized national examining body.

We do not advocate this because we believe that a man who has succeeded in obtaining a diploma knows all about public health work. It takes years of practical experience to become really well qualified; but we do claim that men and women who have taken the trouble to obtain a certificate are likely to become valuable workers more quickly. Some health officers say that they prefer to train their own men, and no doubt a few health officers do good work along this line. Most of them, however, are too busy to attempt it. If I were a health officer and had to break in new men and train them to be useful, I should at least like them to know something of the sciences underlying the work, something of the triumphs of public health work in the past, and have an idea of the best methods now pursued in this and other countries.

I am rather amazed at the indifference of many health officers as to the qualifications of the men who are given them to work with. One would think, in view of the fact that considerable importance is today attached to the proper training of health officers, bacteriologists, public health nurses, and other health workers, that both the Canadian and American Public Health Associations would have adopted before now, some scheme to help the sanitary inspector also.

It should be clearly understood that what has been said about certificates being compulsory does not apply to sanitary inspectors already holding positions. By dint of study and hard practical experience many of these are the equal of any certificated men. We need them all within the fold of our association.

We want to raise the status of the whole profession, and the best, and in fact the only way to do this, is by means of education. We claim to be technical experts, and that we should receive remuneration on the scale of technical experts. This can only be accomplished by actually becoming technical experts and then by convincing health officers and employing authorities that we are entitled to better consideration as such. Get the technical ability and the remuneration will follow naturally. This education should be continuous. Systematic reading on subjects pertaining to public health work is an absolute necessity. There are available a large number of textbooks, reports and journals. We should have a conception of what is being done all over the world in public health work.

I said at the beginning that our first task was to convince the sani-

tary inspector himself of the importance of education and proper training, and of a continuous process throughout life of absorbing knowledge pertaining to his chosen profession and trust that what I have said may convince some of this necessity.

The next most important work of our association is to convince health officers of this necessity for trained men. Sanitary inspectors have not the slightest desire to usurp in any way the functions or prerogatives of health officers. On the contrary, our sole desire is to make ourselves as efficient as possible that we may become what we should be—the right hand of the health officer. In England the position of a sanitary inspector is different. There he is a statutory officer and may exercise certain powers, independently of the health officer. In Canada, however, the health officer is in supreme control, and personally I think ours is the better system, and tends to accomplish better work. What could a health officer accomplish without his assistants? Imagine a well qualified man—a D.P.H. if you like—being appointed as health officer of a large city and given no assistants. He would naturally say: "Where are my sanitary inspectors, my food and dairy inspectors, my communicable disease inspectors and nurses, my bacteriologist? I want these and I want good men and women, properly trained, if you expect me to do anything of value for the community."

And so, we appeal to the health officers for a more active support. We suggest that health officers might help along the following lines:

1. Demand that the public health workers appointed to assist them shall be properly qualified.
2. Assist in procuring such legislation in each province of Canada as will prevent the appointment in future of unqualified persons.
3. Assist in the training of the men and women composing their staffs, both by their own personal instruction, and by helping to secure the provision of lecture courses and demonstrations for sanitary inspectors.
4. In provinces where the Royal Sanitary Institute has at present no examining board, to assist in having such a board appointed. If a Canadian certificate is desired, arrange with the government of each province for a joint examination board composed of representatives appointed by the government, the Royal Sanitary Institute, and the Sanitary Inspectors' Association. In each province the examinations might be almost uniform, and the certificate issued to successful candidates might bear the name of the government of that province. This certificate should, however, be recognized officially throughout Canada as the certificate required by law for all future appointments after a given date. It might even be possible to arrange with the Dominion Government and the Royal Sanitary Institute for the establishment of an examination board for all Canada. Such a board would comprise five or more members for each province.
5. Give this association and the branches thereof their personal sympathy and support.

If we can induce health officers to do this, good results will follow.

If our chiefs, the health officers of Canada, see that we are in earnest in this matter, they can scarcely refuse to help in a matter which so closely touches them and their work.

The above remarks apply equally to mayors, aldermen, and those responsible for appointments to positions in health departments. This association is not a trades union, and does not exist *per se* for the purpose of raising salaries. But, if you are going to appoint men and women to help to carry on this great work, why not make sure that they know their job? If well qualified, they will be cheaper in the end.

The sanitary inspector and the public health nurse come into daily contact with more citizens than any other health officials. In the course of their daily work they are called upon to discuss health topics and measures. They should be well qualified to do this convincingly, and also be able to correct some of the inaccurate notions found among the public and obtain their coöperation.

Just a word here, lest anything I have said should convey the impression that there are no certificated inspectors in Canada—there are many, and most of them belong to our association. Six candidates obtained certificates in Manitoba in April, this year. If certificates become obligatory there will be no lack of applicants.

Dental Service for School Children

FREE dental treatment for children whose parents are unable to pay has recently been started in Habana, Cuba, and nearby towns by the Department of Public Health. Dental inspection of all public school children has been practiced for some time. During December more than 5,000 children had their teeth examined; 3,200 of them needed treatment; 915 were treated free.

Conveyances have just been provided in order to permit better service in the schools on the outskirts of the city.—*Diario de la Marina*, Habana, Jan. 10, 1928.

What Is Public Health?

A Symposium

THE definition of public health is not a mere matter of wording. It is one of fundamental concept. The answer is not quite so simple as the constant use of the term would lead one to expect. There are several reasons for this. Two words are used in the term. The term is comparatively a recent one and not nearly so old as law, religion, medicine (and are these easy of definition?). There are so many activities embraced in public health that workers in these different fields may be expected to view the whole from their particular angle.

Recently a few members of the public health profession were asked to submit their definitions of public health in writing. Some forthwith began to make excuses. One state health commissioner admitted:

Your letter asking for my definition of public health has driven me nearly crazy. I am sorry that I really can't do it now and anyway, nobody would care what my definition was. When the hot weather comes and I am thinking more freely, perhaps I can do something.

Others, while admitting the difficulties of such definitions, stood up under the strain. A few protested, but sent in their requested contribution. One contributor wrote:

Definitions are dangerous things. I remember one on health, by a distinguished authority. It ran somewhat thus: "Health is a condition of the body which only exists when all the organs of the body are in a healthful state."

Still another protested:

I am consistently opposed to definitions of any kind except of single words, since in definitions, we limit our field with meaningless generalities.

The foregoing extracts from the letters received will indicate that the task of defining public health is not an easy one. Yet it is important for us to define our field and to have a clear fundamental concept of it. The definitions which follow, though they show considerable differences, help toward these ends.

E. L. Bishop, M.D., Commissioner, State of Tennessee Department of Public Health:

Public health practice is the organized effort of society to eliminate disease, elevate the standard of health and well-being and increase the span of life. Its scope of activity deals, not only with the causes and conditions of disease, but with the causes and conditions of health as well. In dealing with the causes and conditions of disease, activity must be essentially preventive in character, whereas in dealing with the causes and conditions of health activity must be productive of such causes and conditions.

H. W. Hill, M.D., University of British Columbia, Department of Nursing and Health, offers a self-contained statement which includes the implication that public health applies not only to individuals but to masses:

Public health is the science and art of conscious physical (including mental) adjustment between man and his surroundings in the universe. It is the science and art of human physical life within groups of people.

The Canadian Public Health Journal, in a publication soon to be issued, after the subsidiary terms hygiene and sanitation are first defined, the following definition will be used:

Public health is hygiene and sanitation applied to individuals, *en masse*, with special attention to the inter-relations of the individuals: it is the inclusive term under which may be placed all the science and art of our present civilization which bears in any way on the achievement of better adjustment between man and his environment.

H. S. Cumming, Surgeon General, U. S. Public Health Service:

Public health is a specialty of medicine whose function is to make applicable and to apply medical knowledge for the preservation and improvement of the health of populations.

Matthias Nicoll, Jr., M.D., Commissioner, State of New York Department of Health:

The field of public health comprises two chief functions: First, the administration and enforcement by health officials of the Public Health Law; and second, the promotion by coöperation between official and non-official health agencies—including the medical profession—of well conceived and practical measures directed toward the preservation of life and improvement of physical and mental health.

Curative medicine, in the commonly accepted meaning of the term, should not be included among official public health activities, except in emergencies and when, in the absence of proper medical care, there arises a menace to the health of the community.

George W. Fuller, Fuller and McClintock, Engineers, New York, N. Y.:

Public health is the health of the community considered as a whole, and its maintenance relates particularly to protection and promotion of the health of individuals and community groups through the systematic application of medical, biological, chemical and engineering sciences in establishing suitably favorable conditions for well-being and health.

Professor Ira V. Hiscock, Yale University, School of Medicine, Department of Public Health:

Public health is that which develops and conserves health and lengthens life by means of community activities organized to secure environmental sanitation, communicable disease control, early discovery and preventive treatment of disease, and the education of the public in the principles of healthful living.

J. L. Pomeroy, M.D., Health Officer, County of Los Angeles, Calif.:

Modern public health is the advancement of community health by the creation of an equal opportunity for every citizen to enjoy the fullest possible physical, mental and social development through the application of scientific knowledge in its

broadest sense to the environment of and to man himself, not as act of charity, but as a fulfilment of the obligations of democracy under our constitution.

W. S. Leathers, M.D., Vanderbilt University, School of Medicine, Department of Preventive Medicine, suggests that three points of view may be considered: (1) from the standpoint of the health of the public, (2) with reference to practice, and (3) as a science. He offers a definition of the term from the viewpoint of science and as a phase of medical service:

Public health is the application of the principles of preventive medicine to the control of disease and to the maintenance of individual and community health.

Sophie C. Nelson, R.N., Superintendent of Nurses, Visiting Nurse Service, John Hancock Mutual Life Insurance Company, Boston, Mass.

If the definition of public is "of or pertaining to the people" or "pertinent to or affecting a nation, state or community at large," and health is "a normal condition of body and mind," public health is the result of efforts for attaining and maintaining the maximum health of every individual through the joint endeavor of all.

S. J. Crumbine, M.D., General Director, American Child Health Association:

A recent writer has defined hygiene as follows: "Hygiene aims to make growth more perfect, life more vigorous, decay less rapid, death more remote."

Public health embraces a knowledge of those sciences, the application of which to human conditions and environment is designed to favorably influence the health status of the people of a community as a whole, and which, with applied personal hygiene, will provide the optimum conditions under which the aims of hygiene may be more certain of realization.

E. R. Hayhurst, M.D., Ohio State University, College of Medicine, Department of Public Health:

Public health is the philosophy, art and science of hygiene in its broadest sense as applied to groups of human beings, usually considered as within national, state, or other civic boundaries, and fostered by voluntary as well as official agencies. Hygiene implies the engendering of well-being, maintaining of the same, increasing its possibilities, preventing disease, and providing for the eugenic propagation of the race.

C.-E. A. Winslow, Dr. P.H., Yale University, School of Medicine, Department of Public Health:

Public health is the science and the art of preventing disease, prolonging life, and promoting physical health and efficiency through organized community efforts for the sanitation of the environment, the control of community infections, the education of the individual in principles of personal hygiene, the organization of medical and nursing service for the early diagnosis and preventive treatment of disease, and the development of the social machinery which will insure to every individual in the community a standard of living adequate for the maintenance of health.

SUMMARY

In general it is to be noted that the definitions deal with practices rather than principles. With one possible exception, the definitions do

not include any very direct reference to heredity as a factor in public health.

The similarities are greater than the differences in the definitions which have been listed. The order of the ideas, and the words used as sentence structure bridges between them vary as would be expected. But there is a remarkable uniformity in the ideas presented. What are some of the essential concepts which recur in these definitions?—

That public health deals with the causes and conditions of health as well as of disease.

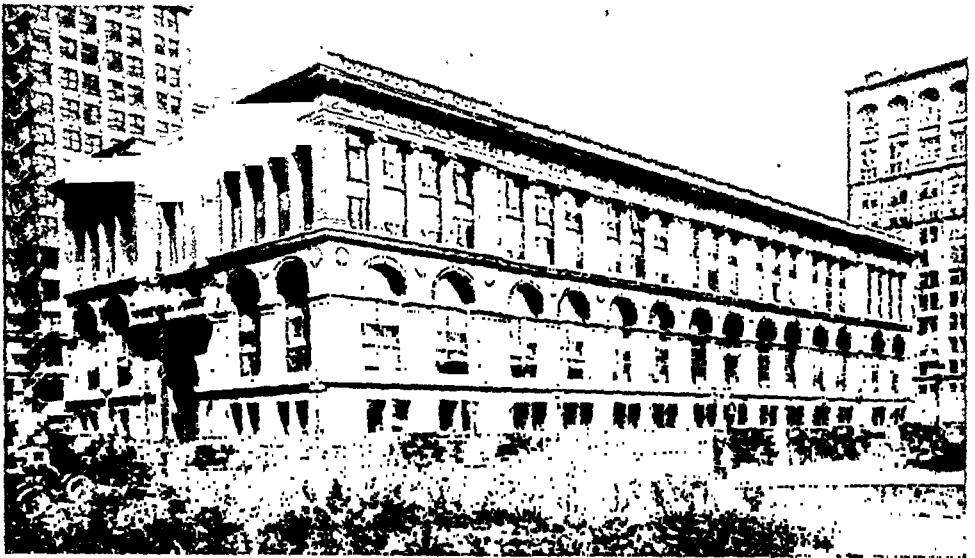
That the object of public health is elevation of the standard of well-being, increase of the span of life, disease prevention, adjustment of man to his environment.

That these objects are achieved in the individual and in social groups.

That the factors involved in terms of knowledge are related to biology, chemistry, education, medicine, engineering, nursing and law.

That public health is made possible by individual and collective effort through official and voluntary agencies.

That public health is both a science and an art.



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TENURE OF OFFICE IN THE HEALTH DEPARTMENT

IN his discussion in *Health Problems in Organized Society*,¹ Sir Arthur Newsholme makes the following statement:

Public health work must be made practicable as a career; and to this end reasonable security of tenure of office must be given to competent officers, and their remuneration must compare not unfavourably with the earnings of physicians in private practice. Happily both these objects are now approximately secured in England.

That they are objects still to be attained in this country every American sanitarian recognizes. Examples of the disturbance of the continuity of state and municipal health work by political interference are recent enough to keep the problem clearly in the foreground. The possibility of the recurrence of such incidents, disturbing alike to the state or city involved, and to general public health progress, is revealed in a recent survey made by the American Public Health Association's Committee on Permanency of Tenure.²

The insecurity of tenure of office among the health officers of 156 cities is revealed by the answers to five questions devised to throw light on the present American situation. Only 1 out of 5 health officers is appointed by a board of health. The health officer's appointment is regulated by civil service in less than one-fifth of these cities. Only 7 out of 10 cities require that the health officer shall devote his time exclusively to the duties of his position. About one-fourth of the cities appoint the health officer for a term of 2 years or less; less than half (46 per cent) make the term of office "indefinite, or at the pleasure of the appointing body."

Other municipal officials escape these hazards of the health officer's position. Almost all superintendents of schools in these cities are appropriately appointed by boards of education. They are on full-time service, as are the majority of city engineers and fire chiefs. The number of fire chiefs enjoying the privilege of an indefinite term of

office appreciably exceeds the number of health officers appointed on this basis. The average term served by the predecessors of fire chiefs in these cities was, consequently, twice as long as that of the predecessors of the health officers.

The second problem, that of adequate remuneration for the health officer, is equally far from solution. The average annual salary of the health officers in these cities was \$4,420, yet the majority required that the health officer possess a medical degree. On the other hand, superintendents of schools, required in only 11 per cent. of the cities to have a college degree, received an average annual salary approximately \$3,000 higher. The implication is, of course, not that the latter salary is too high, but that the former is too low. The desideratum is remuneration commensurate with the professional requirements of the position, and this has certainly not been attained in the case of health officers.

In the present survey, only 3 cities made the degree of Doctor of Public Health compulsory for their health officers. Only 29 of the 1281 state, county and city health officers listed by the U. S. Public Health Service up to January 1, 1928, held the degree of Doctor of Public Health, or the Certificate in Public Health.

If the profession of health administrator, in city, county, or state, is made financially safe, more young men and women will seek special public health training in the universities, and the supply will satisfy the demand. That this aspect of the problem also demands attention is indicated by the report of the American Public Health Association's Committee on Training and Personnel,³ which states that only 104 public health degrees were granted in 1926. Ferrell⁴ has estimated that adequate health service for the entire population of the United States requires the training of 570 health officers annually. The inadequacy of the present output of potential health officers may be readily seen.

Like most of the problems of organized society, the dual health problem presented by the existing insecurity of tenure of office and low remuneration of health officers can be solved best by education. Intelligent citizens, convinced of the vital importance of health work to the community, will guard the position of health officer with the assurance of opportunity for uninterrupted efficient service with adequate compensation. But the educational method is necessarily a slow one. Meanwhile, there is at hand a specific means for hastening the education of the present generation of voters—the use of the *Appraisal Form*. A constantly increasing number of health officers is making this form the basis for a tangible record of progress, which is intelligible to the taxpayer. State-wide surveys in Michigan, Wisconsin, Illinois, and

individual cities—Detroit, Boston, East Orange, Racine—have made notable use of it.

The extension of the use of the *Appraisal Form* will make an immediate contribution to the general and individual solution of the health officer's dilemma.

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RHEUMATISM AND HEART DISEASE

THE importance of rheumatism as a disease of childhood with consequent damage to the heart, has often been pointed out. Apart from the ordinary acute cold, there is scarcely an ailment with which the average practitioner comes more frequently into contact. Possibly "familiarity breeds contempt." It is reasonably sure that the average physician does not consider the usual case of rheumatism as being serious. Parents and those generally who have to deal with children pay little attention to the ordinary rheumatic pains, and it is well known that the so-called "growing pains" are seldom given serious consideration, despite the warnings which have been issued.

Two years ago Drs. Barker and Cole¹ devoted to this subject a volume which deserved wide circulation, pointing out, as it did, that between 80 and 95 per cent of heart trouble in young people had its origin in some form of rheumatism. They quoted studies which indicated that there were at least 167,000 cases of rheumatic fever in the United States in 1916, of which 40 per cent almost certainly developed chronic and serious heart disease. During the World War 88,000 cases of valvular disease were found in 2,500,000 men examined in the draft. A recent compilation showed that in 1917 heart disease was given as the primary cause of death in 129,000 cases, and as contributory cause in 48,000; against 191,000 and 87,000 respectively in 1925; while diseases of the arteries were assigned as the primary cause in 19,000 in 1917, and 23,000 in 1925; against 40,000 and 66,000 respectively as contributory in 1925. While the population increased 38 per cent and deaths from all causes 14 per cent, heart disease showed an increase as a primary factor of 49 per cent and as secondary factor of 81 per cent, while arterial disease gave percentages of 21 and 64 respectively.² From the financial standpoint the cost of deaths from heart disease is estimated as more than \$1,500,000,000 a year, and the cost of hospitalization as almost \$30,000,000.³

Rheumatism has been the object of numerous studies in Great Britain, where the disease seems to be, if anything, more common than in this country. Reports have been issued by the Medical Research Council and the Ministry of Health in addition to two reports by a sub-committee of the British Medical Association.⁴ The cost in money among the insured (approximately one-third of the total population) is some \$85,000,000 annually, and if the late effects are taken into consideration, the disease ranks as one of the chief causes of death.

On May 10, a Conference on Rheumatic Diseases was held at Bath, England, the ultimate outcome of which will be awaited with great interest. Sir George Newman,⁵ as President, gave a short but impressive review of the work before the conference, and a summary of the ideas which are widely held at the present time. That the disease, or diseases, which are usually classed under the name of rheumatism are not understood, and that there is good reason for differences of opinion, is demonstrated in a careful study of rheumatism among children in Cardiff.⁶

The conference was held in three sessions, which considered respectively the social aspects, causation, and treatment of the disease. Prevention seems to have been forgotten, though the paper by Dr. Reginald Miller⁷ dealt largely with environment. No physiologist, no sanitarian, and no epidemiologist, were included in those invited to address the conference. The Public Health Service and the School Medical Service were also overlooked, which is hard to understand when Sir George Newman was the president.

As far as the published reports go, little or nothing new was brought forward. The meeting was for the purpose of collecting evidence, which must now be sifted and evaluated, with the hope that it will lead to research and the adoption of practical measures.

Dr. Miller held that environmental conditions, chiefly poverty and dampness, were the great predisposing factors in children. Changes in the skin make it inefficient in its responses to cold and moisture. Deficiency in vitamin B, with intolerance of carbohydrates, are noted in pre-rheumatic children. In certain forms of chronic rheumatism the endocrine organs are at fault.

Two great obstacles—not to mention others—have barred the way to proper understanding of rheumatism: confusion in nomenclature, and failure to establish the cause of the disease. The most notable work on causation, that of Payne and Poynton, has not been generally accepted nor carried to its legitimate conclusion. The work of Small in this country is not convincing. While we may claim some advance, we must in honesty confess that the entire matter is in a state of confu-

sion, though there is a general tendency to believe that some form of streptococcus is the causative organism. He is a bold or ignorant man who would speak dogmatically on the subject.

Some facts, however, stand out clearly. Rheumatism is very common. Its effects are disastrous to life as well as health. It is especially fatal in the poorer classes who cannot take proper precautions in the way of rest nor obtain skilled treatment. It involves a heavy tax financially on every community. It is possibly to some extent contagious. Certain studies show that the contact case incidence is approximately that of infantile paralysis and cerebrospinal fever, reporting of both of which is required.

There is certainly ground for believing that the disease is preventable to a large extent. From every aspect it challenges the bacteriologist, the epidemiologist, and the health officer. It deserves more study and more careful attention than has been given in the past.

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OF WHAT USE ARE OUR VOLUNTARY HEALTH AGENCIES?

DR. Oliver Wendell Holmes once said that when John and Thomas are talking together it is no wonder that confusion sometimes arises among the six of them. When asked for an explanation he said: "Why, there is the real John and John's idea of John, and Thomas's idea of John, and the real Thomas and Thomas's idea of Thomas, and John's idea of Thomas. That is six, isn't it?" There are three primary forces active in the public health movement, the health official, the unofficial health agency and the medical profession; and this, according to Dr. Holmes's computation, would make twelve possibilities for misunderstanding.

Yet it is of the most vital moment that these three active forces in the community health program should comprehend and sympathize with each other, for success involves the coöperation of all three. In the March issue of the JOURNAL the debt of the community to its health officials was discussed, and it seems time to consider what we owe to the volunteer health agencies which have played so large and so unique a part in health promotion in the United States. A little consid-

eration will indicate that there is scarcely a single stage in the public health movement in which these unofficial agencies have not played an important rôle. We prefer to call them "unofficial" rather than "voluntary" agencies because the latter term is sometimes held to imply a somewhat amateurish quality, an implication wholly unwarranted. In official and unofficial agencies alike, the paid executives are usually professional experts, quite as well qualified in one case as in the other; and in both instances the work is often directed by a voluntary unpaid board. The difference is simply that the health department is supported from the tax levy as a part of the routine machinery of government, while the unofficial agency is supported by contributions, endowments or community chest grants as an expression of the desire on the part of the citizens to further the fullest type of community life.

Let us review briefly some of our debts to the unofficial agency and see how nearly coextensive they are with the entire field of public health. The fundamental movement for environmental sanitation in the United States took its rise in the Citizens' Survey of New York City in 1865; and the latest campaign in communicable disease control for immunization by toxin-antitoxin is in large measure being conducted, in New York State and elsewhere, through the support of unofficial social agencies, following, of course, the general lines first laid down by Park and Zingher.

The anti-tuberculosis movement has from the start to the present time been dominated by the National Tuberculosis Association and other unofficial agencies, and at each important stage it is these agencies which have led, so that even today the bulk of our program for the control of this disease is carried on outside the health department. The movement for the control of infant mortality was initiated, both nationally and locally, by unofficial organizations. Even the health program for school children owes the stimulus which has transformed it in recent years to the vision of Dr. Holt and his associates in the Child Health Organization. The national programs for the control of venereal disease and for mental hygiene owe nearly all of the impetus behind them to the unofficial national organizations active in these respective fields. In industrial hygiene the individual far-sighted employer and the unofficial National Safety Council have accomplished far more than all the legislative and administrative machinery of the states. The development of public health nursing has (except on the Pacific Coast) been accomplished chiefly through unofficial agencies, and more than half of it is still conducted by such agencies. Finally, we can never express our debt to organizations such as the Metropolitan Life Insurance Company, the Milbank Fund and

the Commonwealth Fund for the health demonstrations at Framingham, Syracuse, Cattaraugus County, Fargo, Mansfield, etc., and for the stimulus and guidance they have given to our program as a whole.

The other two parties to the social contract for health promotion, the unofficial agency and the medical profession, must in the last analysis always recognize the ultimate authority of the health official. He, after all, represents the community as a whole and his word must be final. The best health officer is, however, the one who appreciates most gratefully the contribution which the unofficial agency and the medical profession can make to his program, and who uses them most generously and most intelligently for the common cause to which all three are pledged.

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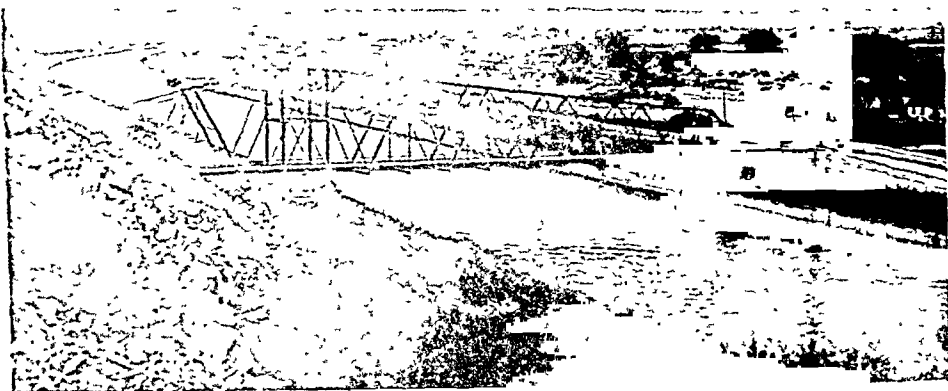
Chm., PROFESSOR I. V. HISCOCK, New Haven, Conn.
Vice-Chm., MARJORIE DELAVAN, Lansing, Mich.
Secy., JOHN SUNDWALL, M.D., Ann Arbor, Mich.

Public Health Nursing

Chm., MARY LAIRD, R.N., Rochester, N. Y.
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Courtesy of Chicago Sanitary District

MAIN CHANNEL AT ROMEO, ILL., LOOKING UPSTREAM

CHICAGO'S PUBLIC WORKS SAFEGUARD ITS HEALTH

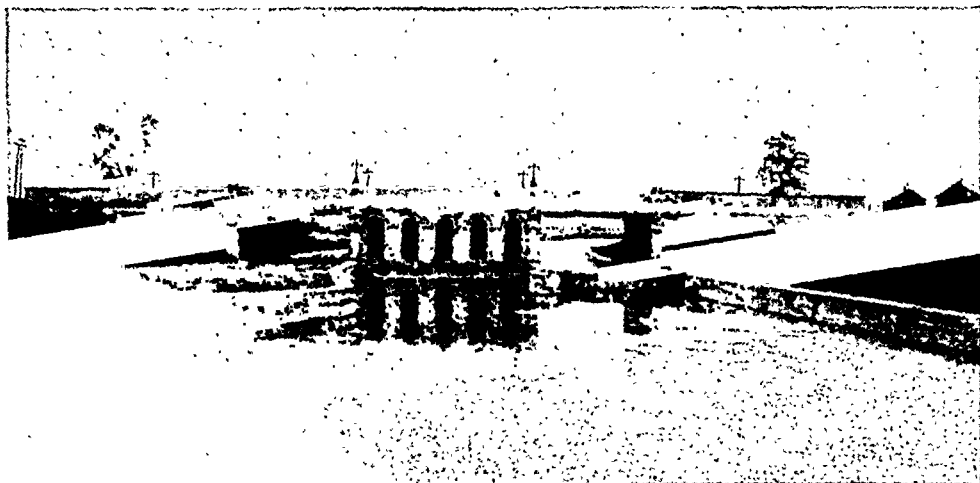
THE 57th Annual Meeting of the A. P. H. A. in Chicago, October 15 to 19, comes at a most opportune period in the development of great engineering projects of profound interest to public health workers. At no other time in the city's history has there been more activity in water supply, sewerage, garbage disposal and mosquito control than at the present. Chicago fully appreciates the truth of the slogan, "Health Is Wealth," and is investing in a most intensive way in health protection.

Before the projects for improvement in water supply and sewerage planned for this city are completed, about \$400,000,000 will have been spent in these great public works. They are a part of Chicago's vast program for municipal improvements and are responsible in no small degree for the enviable public health record attained in that city during the past decade. Certainly every engineer and probably many of health officers and other health workers in the various branches of the profession will want to visit these works. With this in mind, the local committee in charge of arrangements is making special plans to accommodate all who attend the Annual Meeting.

The Sanitary District of Chicago charged with the great responsibility for drainage and sewage disposal in the region of Chicago is now building two of the largest sewage treatment plants in the world. One, the North Side plant, using the activated sludge process will be in operation at the time of the meeting; the other, the West Side Imhoff plant, will be nearly completed in its first unit and at a most interesting structural stage by that time.

The city water department has under construction a new pumping station—its 12th—a tunnel 200 feet under Lake Michigan, and a new intake crib structure said to be the largest ever built. During the last year the department placed in operation the world's largest water pumping station and the most completely equipped experimental water filtration plant ever operated. The new municipal garbage reduction plant, opened only a month ago, is considered one of the finest of its kind in America, and has already attracted wide interest among engineers.

Under a plan developed by the Gorgas Memorial Institute mosquito abatement, work in the suburbs of Chicago has been carried out this year on a very



Courtesy of Chicago Sanitary District

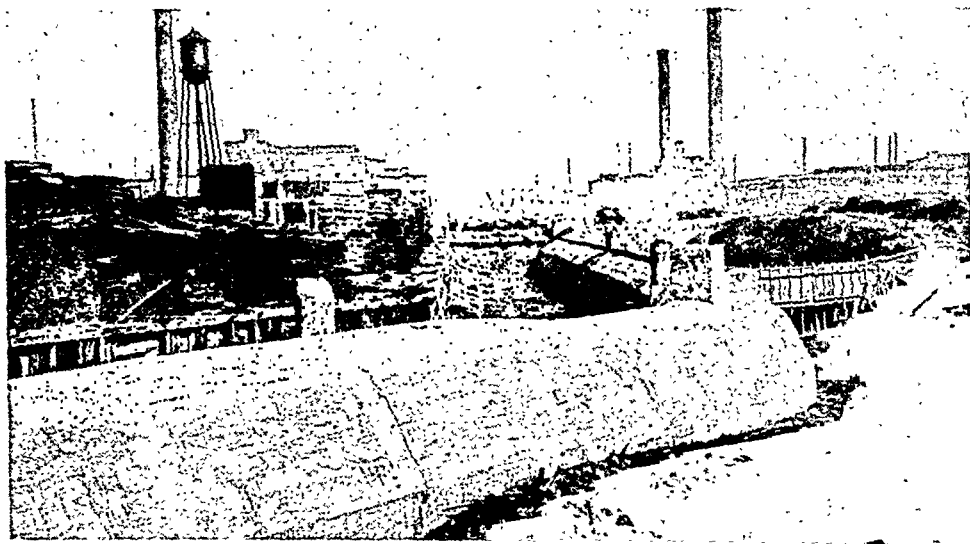
ENTRANCE TO NORTH SHORE CHANNEL, SHOWING PUMPING STATION AT WILMETTE

comprehensive scale through the co-operation of several official agencies. The mosquito problem in this section is a unique one and has many interesting phases.

THE CHICAGO WATER WORKS

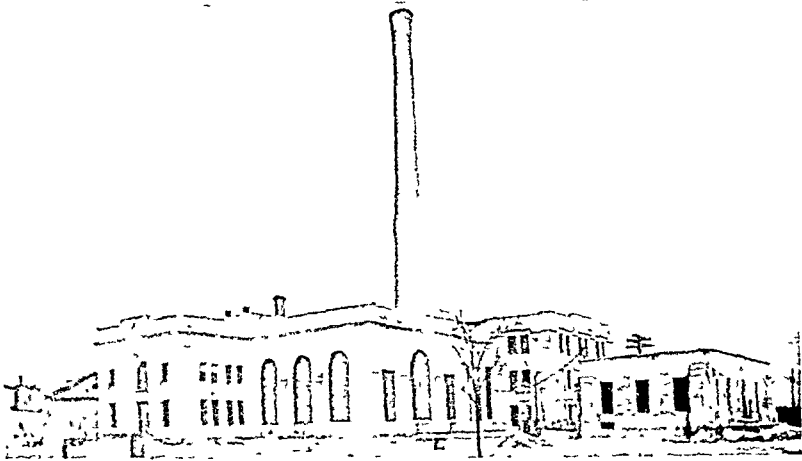
Chicago's water is obtained from Lake Michigan through 6 intakes located from 2 to 4 miles from shore. The water is brought to the 11 pumping stations

through nearly 70 miles of tunnels under the lake and the city. The Thomas Jefferson Pumping Station, now under construction on the northwest side, will be the 12th pumping station supplying Chicago's water. It will have a capacity of 100 m.g.d. and like the more recent stations built by the city will be equipped with centrifugal pumps. The largest of Chicago's 12 pumping stations is the William Hale Thompson station, put



Courtesy of Chicago Sanitary District

39TH STREET CONDUIT EXTENSION, UNDER CONSTRUCTION IN THE BED OF BUBBLY CREEK



Courtesy of Peter Fish

WILLIAM HALE THOMPSON PUMPING STATION

into operation for the first time last spring and having a capacity of over 300 m.g.d. The total pumpage capacity of all stations, including the Thomas Jefferson, is over 1,500 m.g.d. The average daily pumpage is about 900 m.g.d. Chicago pumps more water than any city in the world.

A new tunnel system known as the Chicago Avenue Tunnel is now under construction, approximately four miles

of the tunnel having been dug already through solid rock, 200 feet below the lake. To serve this tunnel intake, a crib structure 90 feet in diameter has been built near the Municipal Pier. It will be launched, towed out to its location over the intake shaft in the lake, and sunk in its final position some time this fall.

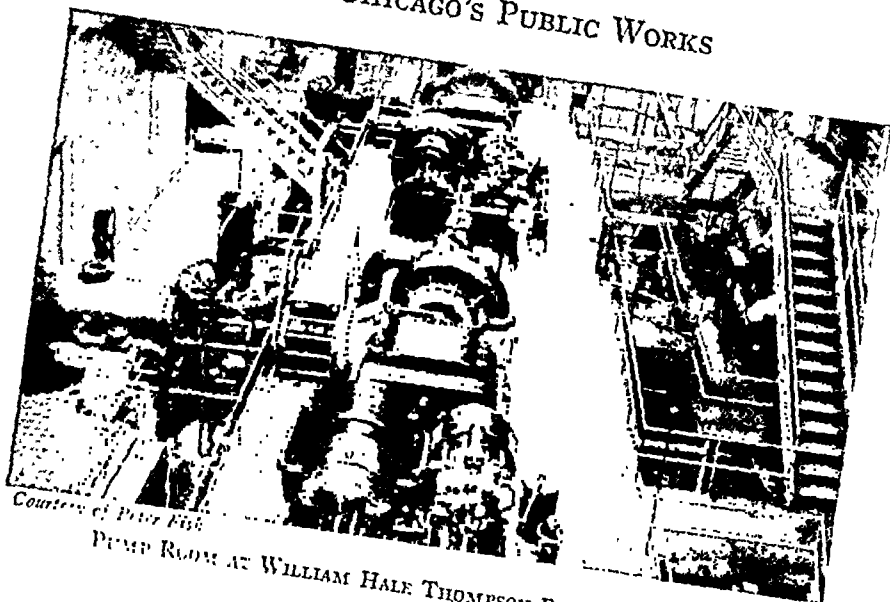
The newer tunnels are all dug through rock and are lined with concrete. They are mostly "horse shoe" in section with diameters varying from 12 to 16 feet. The older tunnels were dug through clay, and are brick lined. They are circular in section, diameters varying from 5 to 10 feet. The oldest, completed in 1867, is still in service. From the pumping stations the water is delivered to the nearly $3\frac{1}{2}$ million consumers through over 3,500 miles of cast iron pipe. The per capita consumption of water in Chicago is excessive, averaging about 300 gallons per day. This is considered to be due largely to wastage by small consumers. Chicago meters only 35 per cent of its water, and this is to the large consumers such as industries and large apartment buildings.

The only treatment given the raw lake water for purification is chlorination at the pumping stations. The system for supervision and control over the



Courtesy of Peter Fish

CHICAGO TUNNEL AT WILLIAM HALE THOMPSON PUMPING STATION



Courtesy of Peter Fish

PUMP ROOM AT WILLIAM HALE THOMPSON PUMPING STATION

chlorination of Chicago's water supply is exceptionally well organized. About 3500 pounds of chlorine are applied to the water daily. While this method provides a safe water, it does not give a first class supply. During and following storms on the lake the water becomes turbid for days and even weeks at a time, especially during the winter and spring months. In the summer and fall the water due to plankton forms in the lake water. The water in the vicinity of the southern cribs is exposed from time to time to pollution from the cities and industrial plants in the southern end of Lake Michigan in the so-called Calumet district of southern Illinois and northern Indiana.

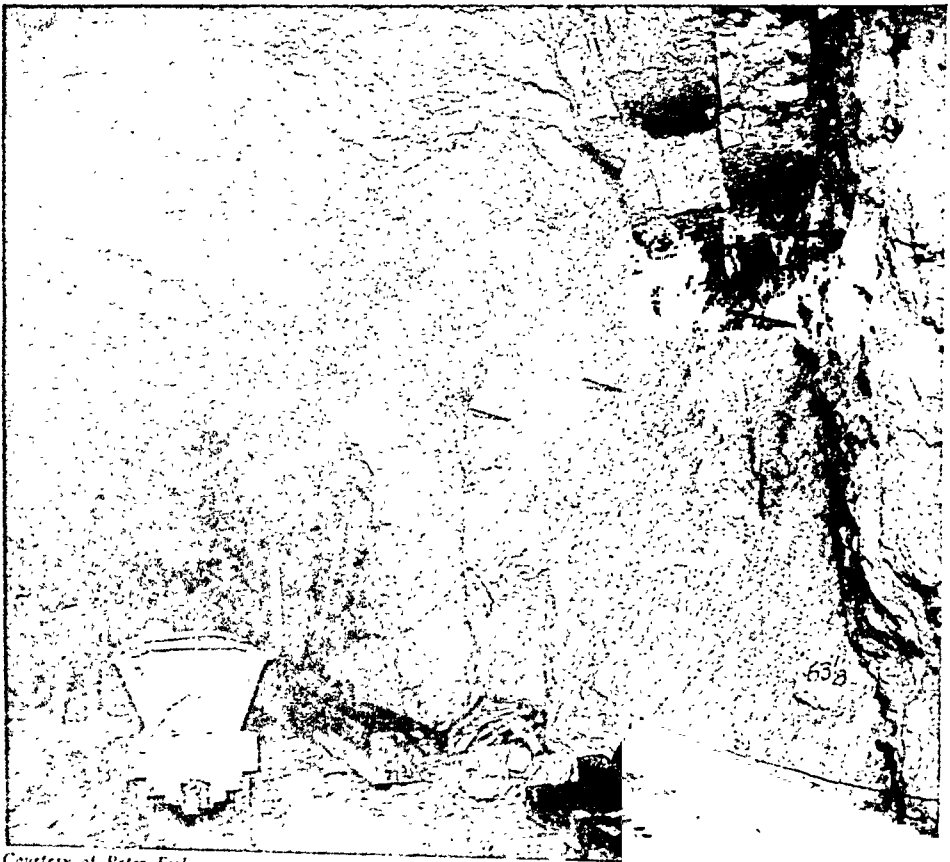
Realizing that a clean, sparkling and safe water supply at all times is not only a necessity but a public asset, Chicago is preparing for filtration of its water. The first step taken was the construction of an experimental plant. This station, which was completed this spring at a cost of about \$150,000, is now operating and a most elaborate series of experiments on the treatment and filtration of Lake Michigan water is being conducted. The plant is in charge of experts and it

is confidently believed by those who have seen the station and reviewed its program that findings of far reaching importance to water purification will result from the experimental work conducted there. The plant consists of two large size rapid sand filters with ten smaller filter units and various types of



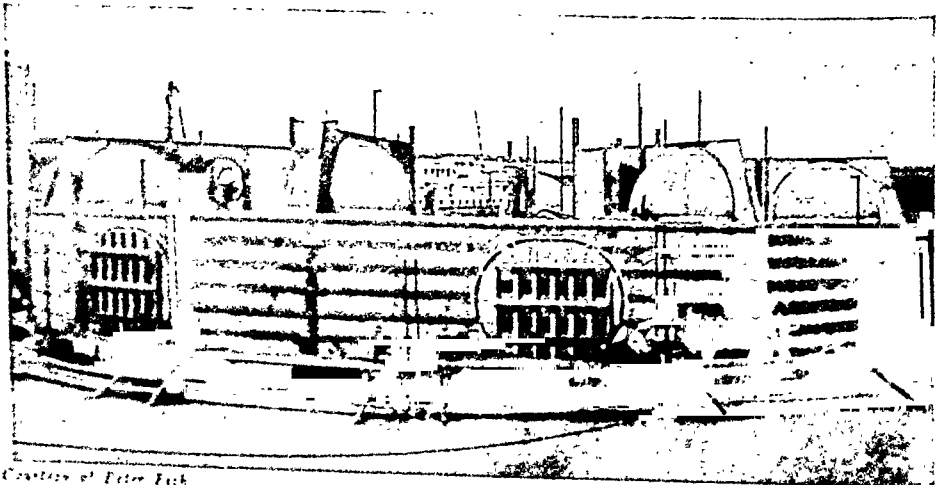
Courtesy of Peter Fish

A SECTION OF THE CONCRETE LINED TUNNEL UNDER WESTERN AVENUE SHOWING JUNCTION WITH A SHAFT TO THE WILLIAM HALE THOMPSON PUMPING STATION



Courtesy of Peter Fish

CONSTRUCTION WORK IN NEW CHICAGO AVENUE TUNNEL THROUGH SOLID ROCK 200 FEET UNDER LAKE MICHIGAN



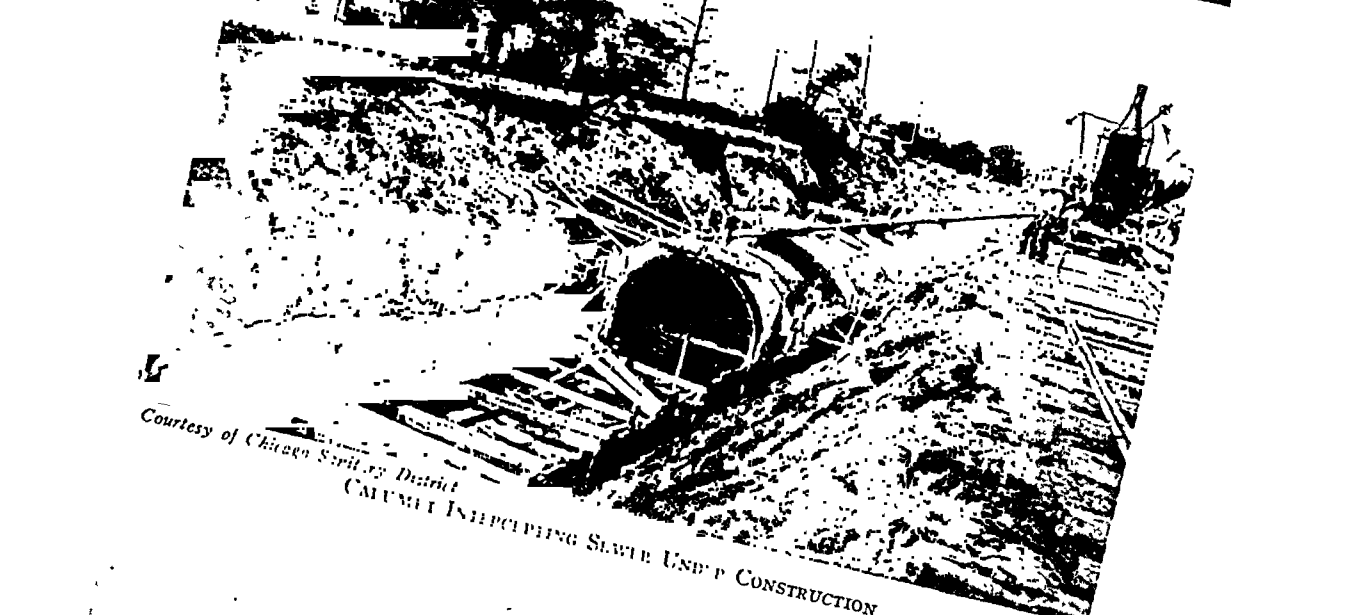
Courtesy of Peter Fish

LAUNCHING A NEW CEED INTAKE FOR CHICAGO WATER WORKS. THIS STRUCTURE WILL BE LOCATED TO ITS LOCATION IN LAKE MICHIGAN AND BE SUNK OVER THE SHAFT TO THE TUNNEL 200 FEET BELOW THE BED OF THE LAKE. THE PLUGGED OPENINGS ARE THE WATER INTAKE PIPES. THE DOOR-LIKE SECTIONS ARE THE AIR CHAMBERS TO BUOY THE STRUCTURE UP UNTIL SUNK IN ITS FINAL POSITION



Courtesy of Chicago Sanitary District

CALUMET-SAG CHANNEL



Courtesy of Chicago Sanitary District

CALUMET INTERCEPTING SEWER UNDER CONSTRUCTION



Courtesy of Chicago Sanitary District

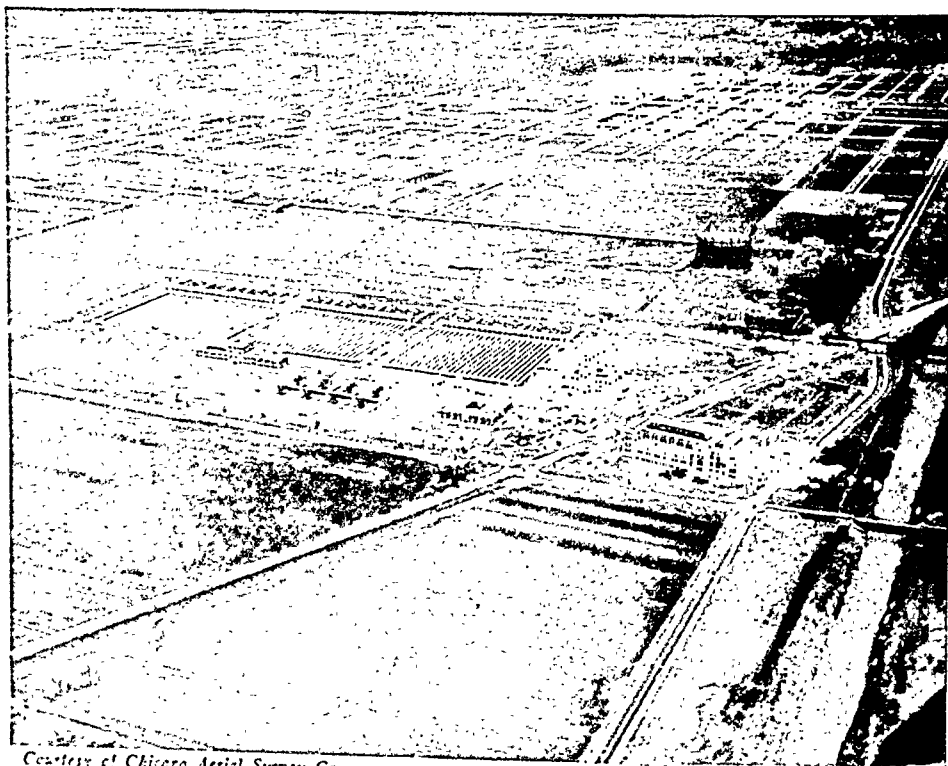
CALUMET SEWAGE TREATMENT WORKS, IN OPERATION SINCE 1922

mixing and settling basins for pre-treatment of the water. It is a station which should be visited by every public health engineer and sanitarian.

The Chicago water works system to date has cost over \$110,000,000 and when filtration plants to treat the entire supply are completed this investment will probably be over \$150,000,000.

Under the present permit from the Secretary of War, a flow of 8,500 cubic feet per second is allowed from Lake Michigan in addition to the water supply.

The original works of the District consisted of the main channel running from the South Branch of the Chicago River at Robey Street to Lockport on the Des Plaines River. This was opened for



Courtesy of Chicago Aerial Survey Co.

NORTH SIDE TREATMENT PLANT. THIS PROJECT WHEN PLACED IN OPERATION WILL HANDLE THE SEWAGE FROM AN AREA OF 78 SQUARE MILES, AND A POPULATION OF 800,000.

THE SANITARY DISTRICT OF CHICAGO

The Sanitary District of Chicago is a municipal corporation, including not only the City of Chicago but 59 other municipalities within its corporate area of 442.35 square miles. Originally organized in 1889 for the purpose of diverting the sewage of Chicago from Lake Michigan and diluting it with lake water in amount at least 3½ cubic feet per second, sewage treatment has been added to its functions to supplement dilution.

service in January, 1900. To this has been added the North Shore Channel, extending from Wilmette to the North Branch of the Chicago River, which it serves to flush out, and the Calumet-Sag Channel running from the Little Calumet River at Blue Island to the main channel at the Sag. Supplementing these channels as part of the dilution system are the intercepting sewers along the lake front both north and south of the Chicago River and the Calumet intercepting



Courtesy of Chicago Aerial Survey Co
 WEST SIDE TREATMENT PLANT THIS PROJECT WILL SERVE AN AREA COMPRISING 100 SQUARE MILES AND IS DESIGNED FOR A POPULATION OF 1,850,000 WHICH IS EXPECTED TO BE REACHED ABOUT 1940

system. By this construction the sewage was diverted from the shores of Cook County, bordering on Lake Michigan from the county line on the north to the Calumet River on the south.

However, with the rapid growth of the city and its industries, the load on the channel grew to such an extent that by

1909, the Sanitary District realized that treatment supplementary to dilution was required. To learn how to do this to best advantage locally, a testing station was built and operated on domestic sewage and three others, packinghouse wastes, tanneries and the corn products waste, respectively, the three most im-



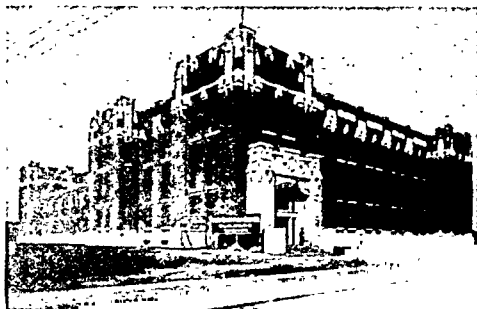
CONNECTION OF WEST SIDE INTERCEPTING SEWER AT WEST SIDE PUMPING STATION SEWER 17 FEET, 6 INCHES HORIZONTAL DIAMETER



Courtesy of Chicago Aerial Survey Co.

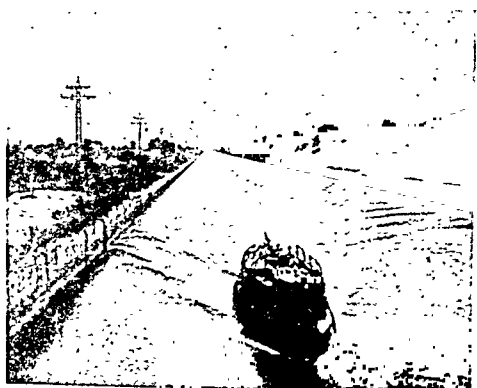
CHICAGO RIVER

(N to the line of demarcation between the polluted water from the North Branch and the fresh water from Lake Michigan.)



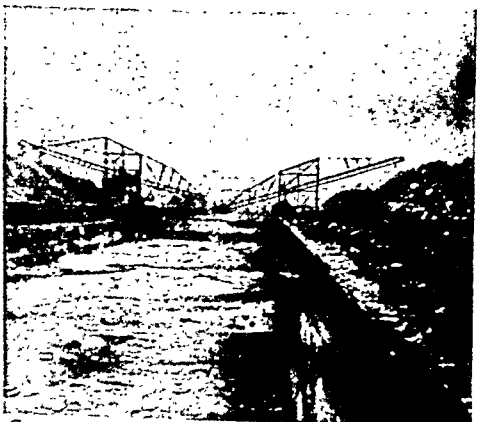
Courtesy of Chicago Sanitary District

PUMP AND BLOWER HOUSE, NORTH SIDE SEWAGE TREATMENT WORKS



Courtesy of Chicago Sanitary District

MAIN CHANNEL, ROCH SECTION



Courtesy of Chicago Sanitary District

CONSTRUCTION OF MAIN CHANNEL, ROCH SECTION

portant groups of industry, aggregating a few years ago an equivalent load of 1,500,000 population as against a human population of 3,000,000. Considerable progress has been made with the handling of the corn products waste by a system of bottling up and concentration of the waste.

Recently a paint waste has been studied because of its effect on biological treatment.

The treatment program comprehends the removal of settling solids from all the sewage as soon as possible, and ultimately biological treatment.

To develop the treatment system for the Sanitary District, a number of projects were outlined, the five major ones being: the North Side, the South Side, the Southwest Side, the Calumet and the DesPlaines River. In addition a number of minor projects for the smaller isolated villages have been planned, and three have been built, one at Morton Grove, one at Glenview, and one at Northbrook.

Of the major projects, the DesPlaines River works was put in service in 1922—an activated sludge plant, serving about 55,000 people, with provision for filter pressing and drying the sludge. At this plant various experimental features have been tried—a testing station is being operated on aeration prior to trickling filters, and a sludge digestion.

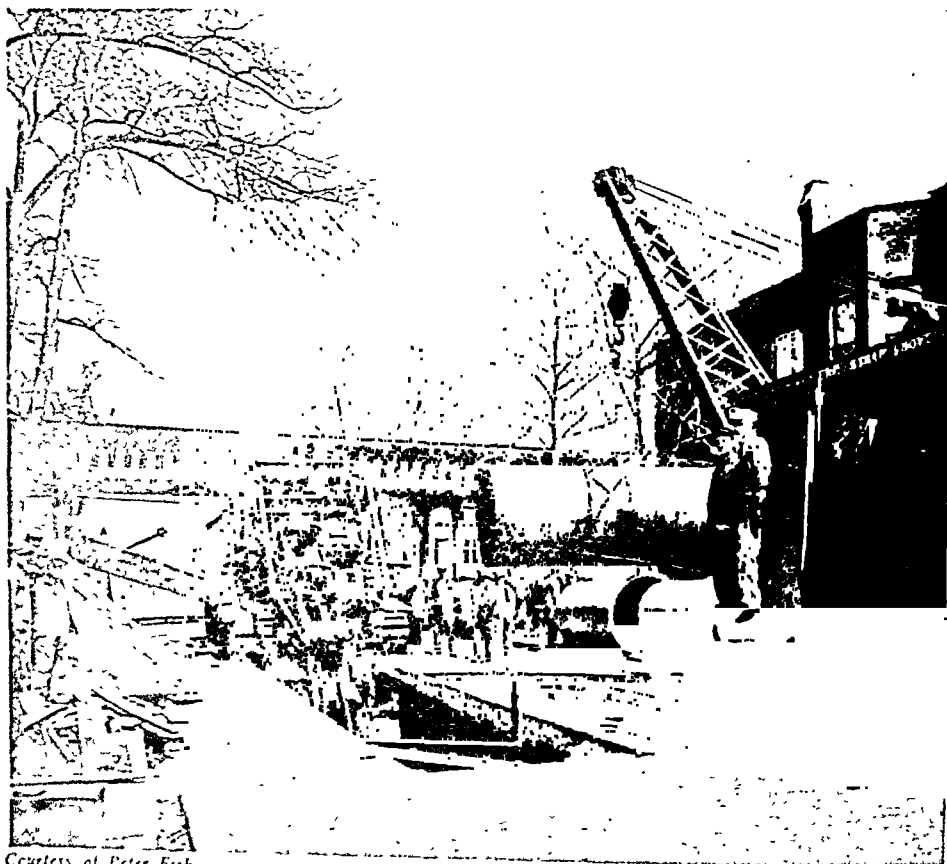
The Calumet works also went into service in 1922, and is now serving about 155,000 people. This is primarily an Imhoff tank plant, but for experimental purposes two of the thirty-two tank units have been equipped as activated sludge units. A small trickling filter of 0.7 acre is also operated for experimental purposes. Tests have been made on sludge filtering and heat drying. A mechanical stripper is being developed for handling the air dried sludge from the outdoor bed. A glass covered drying bed is also operated.

Of the large works two are under con-

struction, the North Side and the West Side. The North Side works is expected to go into operation early in August, the West Side works in October.

The North Side works is an activated sludge plant, the largest in the world. It is designed to handle 330,000 people as of 1930, and an average flow of 175 million gallons daily. The plant includes the pump and blower house; the main building which houses the main meters, return pumps, excess sludge pumps, locker rooms for employes and laboratories; the grit chamber building; and the service building housing the heating boilers, machine shop, and miscellaneous shops. The sewage is pumped up 48 feet into the grit chambers, thence passing through 1-inch opening bar screens to preliminary settling tanks where the coarser solids are removed, then through the main meters to 3 batteries of aeration tanks. From the aeration tanks the sewage passes to the settling basins, the effluent going to the North Shore channel, and the sludge being returned to use over. The excess sludge is to be pumped through an 18-mile force main to the West Side works for digestion.

The West Side works is an Imhoff tank plant, the largest in the world, designed to serve 1,800,000 people as of 1940, and a flow of 400 million gallons per day. The first battery of 3 is now under construction consisting of 36 tank units. The sewage is pumped up 68 feet into the preliminary skimming tanks, about 15 per cent of the flow with the heavier solids being passed through the grit chamber. The flow then passes to the Imhoff tanks after receiving the sludge from the North Side. The effluent flows to the main channel. Sludge drying beds on a large scale will be provided, equipped for mechanical stripping and handling of the air dried sludge. A railroad is also planned to remove the sludge for dumping on some 900 acres reserved for the purpose.



Courtesy of Peter Fish

LAYING THE LARGEST CAST IRON PIPE IN CHICAGO'S WATER WORKS SYSTEM

The Southwest plant has not yet been planned.

To bring the sewage to the various works a comprehensive system of intercepting sewers has been planned. Of these the Calumet and the North Side sewers have been practically completed and the West Side sewer is under construction.

Up to December 31, 1927, approximately \$126,204,310.31 has been expended on the dilution system, and in addition, \$80,378,909.17 on the treatment program, of which a large portion has been spent since 1920. Last year about \$16,371,208.02 was spent in construction of the treatment program. Ultimately some \$155,000,000 will be invested in treatment.

The program now under way has been

approved by the Chief of Engineers, U. S. Army, and the Secretary of War. To carry it out necessitated action by the Illinois State Legislature and increases in bonding and taxing power. At the present time sewage treatment is being extended on a practically unprecedented scale.

The various plants are open to visitors. Descriptive pamphlets are also available on the District works.

In addition to the sewage treatment works, a check is maintained by a fully equipped laboratory, on the water supplies taken from Lake Michigan, some 70-odd samples being analyzed daily. To follow the operation of the treatment works, branch laboratories are maintained at the Calumet and DesPlaines works.

In the study of the Illinois River conditions yearly branch laboratories are maintained at points between Summitt and Alton.

The accomplishment of the Sanitary District can best be measured by the marked reduction in typhoid fever in Chicago. Prior to the opening of the Main Channel in 1900, explosive epidemics had occurred with average yearly death rates as high as 174 per 100,000. Since the opening of the Channel the rate has steadily declined, until for the

last 2 years a rate of under 1.0 has been attained.

In addition, the shores have been cleaned up, making bathing both safe and attractive where formerly it was frequently both unpleasant and dangerous because of the presence of raw sewage.

The condition of the Chicago River has been vastly improved. Flushing also aids in keeping the North Branch and the South Branch in better shape than prior to 1900. Sewage treatment will carry the improvement much farther.



Courtesy of Kaufmann & Fabry Co.

NORTH MICHIGAN AVENUE, CHICAGO—WRIGLEY TOWER, LEFT; TRIBUNE TOWER, RIGHT

ASSOCIATION NEWS

INTERNATIONAL MEMBERS

International membership in the A. P. H. A. is increasing. Within the last month applications for membership have been received from Dr. Hou-Ki-Hou, Commissioner of Health, Shanghai, China; Dr. Ianuarie Gomoiu, Health Commissioner, Ministry of Public Health of Rumania, Bucharest, Rumania; and Dr. Aurel Voinea, Assistant Director of Public Health, Bucharest, Rumania.

A. P. H. A. membership extends into several countries of South America, into Austria, Belgium, Czechoslovakia, Spain, Denmark, France, Germany, Holland, England, Italy, Palestine, Poland, Switzerland, Portugal, China, Japan, Straits Settlements, Dutch East Indies, Syria, Borneo and Africa and Australia, Canada, Mexico and the Philippines. *The American Journal of Public Health and the Nation's Health* is posted to these countries monthly and it has subscribers also in Hungary, Jugo-Slavia, Norway, Russia, Turkey and Sweden.

COMMITTEE ON ADMINISTRATIVE PRACTICE

Professor Ira V. Hiscock of the School of Public Health, Yale University, is in Los Angeles County, Calif., making a survey of the health activities of Los Angeles County. Dr. W. F. Walker, Field Secretary of the Committee on Administrative Practice, has been on the west coast during June and July, stopping in Los Angeles to confer with Professor Hiscock relative to the appraisal of health activities being made in Los Angeles County; attending the Regional Meeting of the Association in Portland, Ore.; and making a reappraisal of health activities of Salem, Ore.

Dr. Walker gave a course of lectures, July 8-11 at Northwestern University on "Public Health Activities of a Chamber of Commerce." The syllabus of this series of lectures includes "Costs of Health Work," "Methods of Study of Local Conditions," "Fighting Disease," and "Prevention of Disease and Health Promotion." He also gave a series of lectures July 22-24 at Massachusetts Institute of Technology on the *Appraisal Form for City Health Work*.

DR. RUHLAND APPOINTED HEALTH OFFICER

George C. Ruhland, M.D., director of the health demonstration being conducted in Syracuse, N. Y., under auspices of the Milbank Memorial Fund, has been appointed full-time health officer of Syracuse, N. Y. The appointment was made by the mayor of the city upon the resignation of Dr. Herman Weiskotten, Dean of the Medical College, Syracuse University, who has been serving as health officer. The position carries a salary of \$10,000 a year. Dr. Ruhland has been serving as deputy health officer of Syracuse, receiving \$5,000 from the city and \$5,000 from the Milbank Fund. The city of Syracuse will now assume the responsibility of his salary, and Dr. Ruhland's appointment goes into effect August 1.

Dr. Ruhland went to Syracuse as director of the health demonstration in 1924. The demonstration, according to the original plans of the Milbank Memorial Fund executives, was to cover a 5-year period, which has almost expired. But it was decided to continue the demonstration indefinitely if a full-time health officer was appointed.

Dr. Ruhland is a Fellow of the Asso-

ciation and is a member of the Committee on Administrative Practice, of the Sub-committee on the Revision of the Appraisal Form for City Health Work, chairman of the Sub-committee on Record Forms, and a member of the Sub-committee on Organized Care of the Sick.

Dr. Ruhland went to Syracuse from Milwaukee where he was commissioner of health.

CORRECTION AND APOLOGY

Listing the death of Dr. Jose Amarante, Rue Lafayette 106, Rio de Janeiro,

Brazil, in the March JOURNAL was an error due to the return of mail by the Rio de Janeiro post office marked "Deceased."

STATE AND PROVINCIAL HEALTH AUTHORITIES

Matthias Nicoll, Jr., M.D., New York State Health Commissioner, was elected president of the State and Provincial Health Authorities of North America at Minneapolis, Minn., June 8-9. Dr. Nicoll is a Fellow of the A. P. H. A. and a member of the Governing Council.

NEW MEMBERS

Alice Ahern, R.N., Ottawa, Ont., Assistant Superintendent of Nursing, Metropolitan Life Insurance Company

Margaret J. Barrett, R.N., New Haven, Conn., Director Bureau of Nursing, Department of Health

J. F. Bradley, Valparaiso, Ind. In charge of water works laboratory

G. Donald Buckner, Dorchester, Mass., Agent of Board of Health

Ralph L. Byrnes, M.D., Los Angeles, Calif., Deputy Health Officer Los Angeles County

Martha A. Cekada, New York, N. Y., Nutrition Specialist

The Chlorine Institute, New York, N. Y., Sustaining Member

Nanna M. Colby, Panama City, Fla., Public Health Nurse, Bay County

Connecticut Public Health Association, New Britain, Conn., Affiliated Society

Cecil I. Corbin, D.V.M., New York, N. Y. (Assoc.)

Oscar A. Dahms, M.D., Chicago, Ill., Vital Statistician

William J. Ellis, M.A., Trenton, N. J., Commissioner State Department of Institution and Agencies

Jesse R. Gerstley, Chicago, Ill., Pediatrician

John W. Gibson, M.A., Victoria, B.C., Supervisor of Provincial Normal Schools (Assoc.)

Ianuarie Gomoiu, M.D., Bucharest, Roumania, Health Commissioner, Ministry of Public Health (Assoc.)

John D. Grant, M.D., Los Angeles, Calif., Deputy Health Officer Los Angeles County

H. J. Green, M.D., Maryville, Mo., Medical Advisor, State Teachers College

Faith Palmerlee Hadley, M.S., Ann Arbor, Mich., Research Assistant in Dental Pathology

Bertha E. Henderson, R.N., Jackson, Mo., School Nurse

Gloster P. Hevenor, C.E., Rochester, N. Y., Consulting Engineer

I. Chandra Sekhara Iya, M.B., Bangalore, South India, Student in Harvard Public Health School (Assoc.)

Laura F. Knowlton, Augusta, Me., Nursing Representative, American Red Cross (Assoc.)

Nicholas Kopeloff, Ph.D., Ward's Island, N. Y., Associate in Bacteriology, Psychiatry Institute

Morton W. Lieberman, B.E., East Orange, N. J., Sanitary Engineer

Dr. Mario Magalhais, Rio de Janeiro, Brazil, Medical Officer of the National Department of Health (Assoc.)

Samuel J. Mason, Perth Amboy, N. J., Water Superintendent

John D. McCarthy, M.D., New York, N. Y., Director of Health Education

G. Foard McGinnes, M.D., Richmond, Va., Director of Laboratories, State Department of Health

William R. Munson, Westport, Conn., Health Officer

J. J. Newell, Los Angeles, Conn., President Union Towel and Case Co., Inc. (Assoc.)

Elizabeth I. Parsons, D.Sc., Charleston, W. Va., Director State Hygienic Laboratory

Lawrence L. Patterson, M.D., Hanalei, Kauai, Hawaii, On health committee in the territorial legislature

Jesse A. Place, A.B., Kalamazoo, Mich., Stu-

dent in Public Health Work
 Edith R. Powell, Miami, Fla., Bacteriologist in charge of Laboratory
 Rosamond Praeger, B.A., Syracuse, N. Y., Supervisor of Child Welfare Nursing, Syracuse Health Demonstration
 Kathryn M. Radebaugh, B.A., Minneapolis, Minn., Executive Secretary Hennepin County Tuberculosis Association
 Agnes Renneke, Redondo, Calif., School Nurse
 Annie L. Robertson, R.N., Tuscaloosa, Ala., County Health Nurse
 Raymond J. Rosenberger, B.S., Asheville, N. C. (Assoc.)
 Dr. Peter P. Shopoff, Stara. Zagora, Bulgaria, District Health Officer (Assoc.)
 E. F. Smith, M.D., Georgetown, Del., Deputy State Health Officer, Sussex County
 Seth H. Hurdle, M.D., Marshallton, Del., Health Officer
 Richard C. Beckett, Dover, Del., State Sanitary Engineer
 Ellis S. Tisdale, S.B., Charleston, W. Va., Chief Engineer, State Department of Health
 Adele Wettlaufer, R.N., Fallon, Nev., County Public Health Nurse
 Eleanor H. Whittinghill, M.S., Winston-Salem, N. C., Nutritionist with Health Department

Floyd P. Wilcox, D.V.M., Los Angeles, Calif., Director Division of Dairy Products, Los Angeles County Health Department
 Mabel I. Wilcox, Lihue, Kauai, Hawaii, Field Supervisor of Public Health Nursing
 Carl R. Williams, Los Angeles, Calif., Chief Quarantine Officer, Los Angeles County Health Department
 Frank A. Wilmot, M.D., Alhambra, Calif., Deputy Health Officer, Los Angeles County
 Percy B. Wiltberger, M.D., Columbus, O., Health Commissioner, Franklin County
 Lois Witham, Sc.D., Foochow, China, Head of Department of Public Health and Welfare, Hwa Nan College (Assoc.)
 Mark Zeifert, Stapleton, N. Y., Assistant Bacteriologist, U. S. Marine Hospital

DECEASED MEMBERS

R. A. Wilson, M.D., City Health Officer, El Paso, Tex. Elected 1927
 Professor Charles I. Corp, 2114 Westlawn Ave., Madison, Wis. Elected 1924
 L. M. Field, M.D., Beloit, Wis. Elected 1919
 Arthur W. Bingham, M.D., 15 E. 76th St., New York, N. Y. Elected 1925

APPLICANTS FOR FELLOWSHIP

LABORATORY SECTION: Fred Berry, Columbus, O.; Robert D. Defries, M.D., Toronto, Ont.; Pearl Griffith, Jacksonville, Fla.; Edward G. Huber, M.D., Houston, Tex.; Courtland S. Mudge, Davis, Calif.; Frederick O. Tonney, M.D., Chicago, Ill.

HEALTH OFFICERS SECTION: Ralph G. Beachley, M.D., Chestertown, Md.; Ernest M. Burns, M.D., Huntington Park, Calif.; Ludovic J. Dumont, M.D., Lewiston, Me.; Hugh O. Jones, M.D., Chicago, Ill.; William A. King, M.D., San Antonio, Tex.; Grundy E. McDonald, M.D., Long Beach, Calif.; Charles A. Neal, M.D., Cincinnati, O.; Alton S. Pope, M.D., Chicago, Ill.; Richard W. Pullen, M.D., New Britain, Conn.; Elgie R. Shaffer, M.D., Columbus, O.; Millard E. Winchester, M.D., Atlanta, Ga.

VITAL STATISTICS SECTION: Lowell J. Reed, Ph.D., Baltimore, Md.

PUBLIC HEALTH ENGINEERING SECTION: Gerald M. Fair, Cambridge, Mass.; Arthur P. Miller, Chevy Chase, Md.; William J. Orchard, Newark, N. J.; Leon G. Tedeschi, M.D., Cincinnati, O.

INDEPENDENT HYGIENE SECTION: Philip K. Fournier, M.D., San Francisco, Calif.; George H. Gorman, M.D., Wilmington, Del.; John E. G. ... Chicago, Ill.; T. Lyle Harlett, M.D.,

East Pittsburgh, Pa.; Derric C. Parmenter, M.D., Boston, Mass.

FOOD, DRUGS AND NUTRITION SECTION: Oswald M. Gruhitz, M.D., Detroit, Mich.; Charles R. Moulton, Ph.D., Chicago, Ill.

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PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D.P.H.

Diphtheria From Carriers—A study has been made in Baltimore of the prevalence of clinical diphtheria among family contacts who have been exposed to known carriers, virulent and avirulent. Statistically it has been shown that the family contacts of carriers are exposed, within the first month after discovery, to a risk of clinical diphtheria much greater than that of the control population living in the same neighborhood. The incidence among family contacts of carriers during this period, is, however, only about one-tenth that of those in similar association with recognized clinical cases. While questioning the adequacy of their statistical evidence the authors conclude that the family contacts of carriers of virulent bacilli experience a greater risk of having clinical diphtheria than do those associated with carriers of avirulent bacilli. The brief period of increased incidence in the families of carriers is followed by a compensatory period of at least 2 months' duration in which the attack rate falls below that of the control group.—James A. Doull, Wm. R. Stokes, & G. Foard McGinnes; *The Incidence of Clinical Diphtheria Among Family Contacts Subsequent to the Discovery of Carriers*;—*J. Prev. Med.*, II:191 (May), 1928.

Schick Tests in Honduras—A study has been made of the Schick test as applied to 430 natives of Honduras in 1926 and 1927, and 40 school children of American or American-Spanish parents, and 31 negro school children. The natives, as a whole, showed a very high percentage of immunes, while the American school children exhibited a much lower percentage of immunes. In a group of 34 American children from 6 to 14 years of age inclusive, 55.8 per

cent were positive as compared with 9.6 per cent in the 196 children of the same age who were natives of Honduras. The author feels that congested living conditions have much to do with the difference in susceptibility, and that cities usually show a lower percentage of susceptibility than do rural communities.—William H. Taliaferro, *The Results of Schick Tests in Tela, Honduras*, *J. Prev. Med.*, 2:213 (May), 1928.

Scarlet Fever Immunization—Since July, 1924, in Gary, Ind., an effort has been made to immunize school children against scarlet fever. The general procedure has been to give a Dick test followed by 5 doses of toxin given at intervals of 5 to 7 days, and Dick tests given 2 weeks after the last dose. The dosage has been increased until 500, 2000, 8000, 25,000, and 80,000 have been given since September, 1927.

Fifty-three per cent of 6452 primary Dick tests have been positive. In general, younger children show a higher incidence of positive tests, and more of the American than of the foreign born children show positive reactions.

Three thousand, two hundred and fifty-five Dick re-tests have been given. Sixty-six per cent were negative, 17 per cent slightly positive, and 17 per cent positive. Of a small group that were Dick negative in May, 1927, after a full course of doses, about 70 per cent were still Dick negative in December, 1927.

Of the 433 cases of scarlet fever reported to the Gary Board of Health since July, 1924, 12 were in persons known to be Dick positive, and 6 in persons who had been pronounced Dick negative.

The authors conclude that the incidence of scarlet fever and the number of

deaths have decreased, and especially has the reduced incidence been affected among those who have had scarlet fever toxin.—Margaret G. Smythe and O. B. Nexbit, *The Dick Test and Immunization Against Scarlet Fever in the Public Schools of Gary, Indiana*; *J. Prev. Med.*, 2:243 (May), 1928.

Health Conditions in Bronx—The Bronx Borough of the City of New York has a large excess population between the ages of 20 and 45 years when compared with the standard United States distribution. The excess is 56,000 in this group, indicating for the men 13 per cent and for the women 19 per cent more than elsewhere.

The natural rate of increase of population in Bronx is the highest of any borough, due to a high birth rate as well as a low death rate. In 1926 the Bronx rate of natural increase was 11.90 per 1,000 annually, against 3.85 in Manhattan.

In 1926 the crude death rate was 10.52 per 1,000 and was thus 17 per cent more favorable than that of New York City in general.—G. J. Drolet; *Health Conditions in the Bronx, New York City*; New York Tuberculosis and Health Association, March, 1928.

Fargo Demonstration—Two parts of the final report of the Fargo Demonstration which has been carried on since 1923 through the coöperation of the Commonwealth Fund with the City of Fargo have appeared. At the beginning of the demonstration at Fargo the score, as indicated by the *Appraisal Form*, was 320 as compared with 499 as an average

score of 86 small cities in 1923. In 1927 the Fargo score had risen to 827 points.

During the year 1927 the Child Health Demonstration Committee of the Commonwealth Fund has gradually withdrawn from the activities which they had organized, leaving local personnel in the full direction of the program. The public health staff of the city paid from local funds consisted at the end of 1927, in a full-time health officer, sanitary inspector, 6 nurses, supervisor of health education, a part-time physician, a full-time dentist, and 2 clerks. The community health program for the fiscal year ending June 30, 1928, calls for the expenditure of \$1.51 per capita. The health department share of this is \$1.06, of which only \$0.38 goes to the isolation hospital. The board of education contributes \$0.41 per capita.

Dr. Walker states in his summary report that "bringing its health work up to its present high level in the space of 5 years is an achievement of which Fargo may well be proud." He further emphasizes certain definite needs as, an increase in immunization against diphtheria and smallpox; a more adequate follow-up of cases of communicable disease; a more intensive program for the early recognition and care of tuberculosis cases and contacts; a more adequate financing of dental service; an increased supervision of milk and food supplies; and provision for continued progress in community health education. —Five Years in Fargo—Part 1 and Part 2—The Commonwealth Fund Division of Publications, *Bulletins No. 7 and 8*, May, 1928.

LABORATORY

C. C. YOUNG

ANTIGENIC PROPERTIES OF BACILLUS TYPHOSUS FROM A SMALL EPIDEMIC

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THE following report is made because of the interest which attaches to the occurrence of typhoid fever in a recently vaccinated individual and because a study of the infecting organisms and other organisms isolated from the same epidemic showed them to be identical with each other but different from the strain used for vaccination. The patient, O. S. aged 45, received three doses of a standard commercial typhoid vaccine on December 4, 11, and 18, 1925. This vaccine is prepared from the Rawlings strain of *B. typhosus* and strains of *B. para-typhosus* A and B, obtained from a reputable source. No appreciable reaction resulted from the vaccination. On August 10, 1926, the patient became ill. He had a temperature of 102°, diarrhea, headache and general malaise. On August 14, a blood count showed a total white count of 6,600; polymorphonuclear cells, 66 per cent; large lymphocytes, 4 per cent; small lymphocytes, 30 per cent. A stool culture was made and typhoid and paratyphoid bacilli were isolated. The typhoid organisms were found to be typical culturally but agglutinated slowly and in low dilutions only with antityphoid serum prepared from the Rawlings strain. The paratyphoid bacillus resembled *B. paratyphosus* B in its cultural reactions. The patient ran a typical typhoid course of rather mild type. The temperature was seldom above 102°. There was no delirium. On August 25, he developed phlebitis of the

popliteal vein. He was discharged from the hospital October 3, 7 weeks and 5 days from the onset of illness. Stool cultures made for release on October 8 showed typhoid bacilli but in relatively small numbers. Cultures made on October 10 and October 16, showed no typhoid bacilli. Several subsequent examinations showed that the stools continued negative. Although the typhoid bacillus was not isolated from the blood stream, the typical clinical course and the epidemiological history as given below precluded the idea that the patient was a typhoid carrier and that the organisms found in the stools were not the etiological factor.

At about this same time 7 other cases of typhoid fever were reported and an investigation showed that they occurred on the same dairy route. These cases had been preceded by a fatal case about 2 weeks before where the patient also took milk from this dairy. The source of infection was traced by the State Board of Health to a carrier who had recently come to the dairy. The patient, O. S., took milk from this dairy and was a heavy milk drinker, so that it seemed probable that the source of his infection was the same as that of the other cases in the epidemic.

In view of the fact that the strain of typhoid isolated from O. S. was somewhat unusual in its serological reactions it seemed worth while to investigate the antigenic properties of as many

other strains as could be isolated from this same epidemic. From the 9 cases which occurred, 6 strains were isolated from the following sources: C, blood; M, blood; S, urine; O. S., stool; N, stool; C., stool. All of these cases had typical clinical cases of typhoid fever. Unfortunately, the strain isolated from the carrier could not be obtained. Accordingly a study was made of the cultural and antigenic reactions of these strains to try to ascertain if they were identical as might be expected from their common source, and also if they differed in any respect from the Rawlings strain which had been used for vaccination in the case reported. Culturally these 6 strains were typical for *B. typhosus* and differed only from the Rawlings strain in that they fermented xylose more rapidly. In order to ascertain the antigenic properties of the epidemic strains, agglutination and absorption tests were used.

Antisera were prepared from each of the 6 strains and from the Rawlings strain. Cross agglutination tests showed that the strains from the epidemic agglutinated to titer with the antiserum prepared from these strains but that they agglutinated slowly and in low dilution only with the anti-Rawlings serum. The anti-Rawlings serum agglutinated the Rawlings strain at dilutions of 1-5000 and the milk strains at from 1-500 to 1-1000 only. Absorption tests were made by absorbing each antiserum with all the milk strains and with Rawlings. These tests showed that the epidemic strains absorbed out all the agglutinins for each other and for the Rawlings strain but that when they were used to absorb anti-Rawlings serum they failed to remove the agglutinins for the Rawlings strain. Absorption of the sera prepared from the epidemic strains with the Rawlings strain weakened the titer for the milk strains but did not remove all the agglutinins for the homologous strains.

Agglutination and absorption tests with serum from O. S. after recovery showed that his serum agglutinated all the epidemic strains in dilutions of 1-500 but that it agglutinated the Rawlings strain only partially at a dilution of 1-10. The O. S. organisms used for absorption with O. S. serum removed all the agglutinins for the milk strains while absorption of O. S. serum by the other milk strains removed the agglutinins for the O. S. strain. Use of the Rawlings strain for absorption with O. S. serum removed the agglutinins for the O. S. strain and the other epidemic strains only in high dilutions of the serum. In view of the foregoing agglutination and absorption tests it seems fair to conclude that the strains of typhoid isolated from the milk-borne cases were identical with each other and probably identical with the strain isolated from the carrier at the dairy. The tests also show that the epidemic strains differed from the Rawlings strain used for vaccination in the case reported.

Although the success of antityphoid inoculation is unquestioned an inquiry into the literature reveals a number of cases of typhoid fever occurring in vaccinated individuals. We have been able to find a record of 340 cases of typhoid fever in vaccinated persons occurring since 1915, with some records of epidemics where figures are not given.¹⁻¹¹ These were all well established cases of typhoid in which the individuals had been vaccinated by the subcutaneous method with one strain of typhoid or with typhoid, paratyphoid A and paratyphoid B. Many cases were reported from the French, British and German armies during the early part of the World War, but as vaccination then did not include the paratyphoid bacilli and as careful bacteriological examination was not always made, many of the so-called typhoid cases may have been paratyphoid infections. Such cases were not included in the above number.

Vaughan¹ sums up what seems to be the consensus of opinion as to the causes of typhoid fever in vaccinated individuals as follows:

1. Overwhelming infection
2. Strains of organisms against which the ordinary vaccine does not immunize
3. Failure of patient to react
4. Failure of inoculation

In our opinion two of these factors may have been operative in this case. The patient probably received a very heavy dose as he was accustomed to drink large quantities of milk and the antigenic differences which distinguished this organism from the Rawlings strain may have been sufficient so that the antibodies developed as a result of vaccination did not protect against the epidemic strain. It is not known whether the patient reacted after vaccination with the formation of antibodies against the Rawlings strain. His serum gave a partial agglutination at 1-10 with the Rawlings strain after he was convalescent. The antigenic variation from the Rawlings strain which the epidemic strains exhibited confirms the observation previously made by one of us.¹² A number of other authors also have observed antigenic variations in well identified strains of *B. typhosus*. Blankenhorn,¹³ Ecker,¹⁴ and Myers¹⁵ have observed antigenic differences in strains residing in the tissues of the host for long periods of time and in carriers. The work on these epidemic strains suggests

that we were dealing with such a strain which may have become atypical from long residence in the carrier. Olin¹⁶ and others have considered cross absorption tests as evidence of the identity of strains isolated from epidemic cases arising from a common source.

SUMMARY

The case of typhoid fever reported here shows the occurrence of infection in a recently vaccinated individual. The strain recovered from the patient was found to be antigenically identical with 5 other strains from cases which received their infection from a common source, i.e., contaminated milk. These strains differed antigenically from the Rawlings strain used in the vaccine.

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VITAL STATISTICS

LOUIS I. DUBLIN, PH.D.

The Homicide Record in American Cities, 1927—Deaths from homicide seem to have reached a stationary condition at one of the highest points in our history. During 1927 the rate in 122 American cities, having an aggregate population of about 35,000,000, was 10.4 per 100,000, which is slightly lower than the 1926 rate of 10.8. In 30 cities for which data can be secured as far back as 1900, the rate has increased steadily with few fluctuations from 5.1 in 1900 to 11.3 in 1924; since then, however, it has dropped to 10.1 in 1927.

There were no deaths in 1927 from homicide in Brockton, Malden, Newton and Somerville, Mass., Harrisburg, Pa., Lakewood, O., Lincoln, Neb., Newport, R. I., and Passaic, N. J. Low death rates of 1.0 or less were found in Camden and Elizabeth, N. J., and Lowell, Lynn and New Bedford, Mass. The highest murder rates were 69.3 in Memphis, Tenn., 63.0 in Birmingham, Ala., 55.5 in Charlotte, N. C., 54.0 in Jacksonville, Fla., 43.4 in Atlanta, Ga., 40.0 in Miami, Fla., and 39.7 in East St. Louis, Ill. The largest cities of the country with their congested slums and alleged rule of violence and crime had rates which were considerably lower than these southern cities. Boston had the lowest rate, 3.9, New York City 6.1, Philadelphia 8.4, Baltimore 10.3 and Chicago 13.3. Conditions in Chicago seem to be improving, however, for the 1926 rate was 16.7. An improvement is also apparent in Detroit, Mich., where the rate dropped from 25.3 in 1926 to 18.7 in 1927.

The mortality from homicide in American cities does not compare at all favorably with the rates of foreign coun-

tries. In 1926 the rate for England and Wales was 7 per million as against 104 for the American cities. The rate for Italy in 1925 was 44 per million and the corresponding rate for the United States Registration Area was 86. In the same year the Canadian Registration Area, which included all of Canada except the Province of Quebec, had a rate of 14 per million.

An analysis of the homicides of Jefferson County, Ala., was made for the years 1920-1926. During this time there were 560 deaths of males and 137 of females from homicide. The average age at death of the females was 25.8, for the males it was 31.9 years. Six hundred and eighty-nine of these deaths took place in Birmingham city but 19.1 per cent of the males and 15.6 per cent of the females were non-residents of the city. Seventy-five and seven-tenths per cent of the male deaths and 59.7 per cent of the female deaths were due to firearms while 66.2 per cent of the white persons and 74.4 per cent of the colored were killed in this manner.

The death penalty is enforced in much too small a proportion of cases and with too long a delay to be effective in preventing homicides. A study of the 10-year period ending with 1926, in 6 states that did not enforce the death penalty and in 5 that did, showed the average murder rate in the non-capital-punishment states to be 42 per million and 57 in the states which enforced the penalty. The number of deaths from homicide for each execution varied from about 36 in Pennsylvania and 44 in New York, to 170 in Ohio and 274 in Massachusetts. These statistics prove that the infliction of the death penalty falls on an insign-

nificant fraction of the murderers in these states and that therefore the best purposes of justice would be served by abolishing the death penalty and substituting life imprisonment without opportunity of pardon or commutation of sentence.—Frederick L. Hoffman. *Spec-tator* 120:8 and 40-42 (Mar. 29), 1928.

London Vital Statistics, 1927—

The statistical abstract published by the London County Council shows that the estimated population of the administrative county of London in 1927 was 4,550,000. That recorded in the last three censuses was 4,536,257 in 1901; 4,521,685 in 1911, and 4,484,523 in 1921. Greater London has increased in population from 6,581,402 in 1901 to 7,805,870 in 1921. The average birth and death rates per 1,000 population of the decennium 1841-1850 were 31.6 and 24.8, respectively, and the natural increase rate was therefore 6.8. In the quinquennium 1921-1925 the birth and death rates were 19.9 and 12.3, respectively, and the natural increase rate 7.6. The most striking fact is the fall in infant mortality from an average of 167 in the decennium 1841-1850 to an average of 71 in the quinquennium 1921-1925. The rate recorded in 1927 was still lower, 59. From 19,586 in 1917 the number of street accidents increased to 48,153 in 1926. The 1927 figures are not yet published, but it is feared that this ominous increase has been maintained. Accidents per 1,000 of population have risen from 2.61 to 6.71.—London's Moving Populace and Vital Statistics. *J. A. M. A.* 90:1489 (May 5), 1928.

Health of Pretoria, Union of South Africa—In the year ended June, 1927, the European population was 42,000 and there were 23,000 colored persons—Africans, Eur-Africans, and Asiatics. The European death rate was 7.0 per 1,000, as compared with 7.7 in the pre-

vious year. The death rate for the colored races was 16.0 per 1,000. The European infantile mortality rate of 49 per 1,000 births is the lowest on record for Pretoria; last year's figure, which is considered to be very low, was 2.5 higher. The infant mortality for all colored races was 315 per 1,000 registered births. The natives (Bantus or Kaffirs) suffered most heavily, their rate being 388.5 per 1,000, though this figure is an improvement on that of the previous year, which was 483 per 1,000. In Benoni the rate is quoted as 847 per 1,000, the number of deaths in native infants under 1 year in January, 1927, being equal to the number of births during the month. On the West Rand conditions, though bad, are better than on the eastern end of the Reef; in Krugersdorp last year the native infantile mortality rate was 320 per 1,000 births, but these figures undoubtedly exaggerate the state of affairs. Notification of native deaths is practically complete, but that of births is very defective.

Excluding imported cases the infectious diseases notified among Europeans were: typhoid 67 with 2 deaths, scarlet fever 25, diphtheria 20, measles 209, whooping cough 100, other infections 33; among non-Europeans: typhoid 26 with 8 deaths, diphtheria 2, measles 17, whooping cough 8, tuberculosis 13, other infections 8. Typhoid vaccine was administered to 1,497 persons—545 Europeans and 952 non-Europeans. Only 12 cases of malaria were notified in the municipality during the year; 8 of the patients had either come to Pretoria from elsewhere or had been infected outside the area.—*Brit. M. J.* Mar. 3, 1928, p. 370.

Health Conditions in Prussia During the Year 1927—Health conditions in Prussia, during 1927 were comparatively favorable. There were only two outbreaks of typhoid of any propor-

tions. The first outbreak, which was traceable to infected cheese, comprised 175 cases and 12 deaths. The second outbreak, which spread over seventeen towns and villages through contact transmission from patient to patient, included 155 cases and resulted in 14 deaths. As in recent years, there were frequent outbreaks of meat poisoning involving a considerable number of cases.

During the post-war period, diphtheria and scarlet fever were on the decline, but, during the past 2 years, they have increased. In 1927, the increase of both diseases was marked, while the number of scarlet fever cases, over 1926, was almost doubled. In the main, however, the diseases have run a mild course, so that the deaths have not increased in the same proportion as the morbidity. In Berlin and in some few cities to which the disease was carried, diphtheria appeared in a malignant form, and caused a case mortality of 12 per cent. In some parts of Prussia, especially in the sections of the province of Saxony that border on the Free State of Saxony, epidemic infantile paralysis was prevalent, evidently carried there from the focus of infection in Leipzig and vicinity. The number of cases and deaths was, however, considerably less than in 1926.

Puerperal fever still shows a comparatively high morbidity and mortality. Tuberculosis, which, during the post-war years, showed an increased incidence, appears to have been brought to a standstill; the number of deaths from tuberculosis has decreased. For a number of years, an increasing incidence of goiter has been observed in Prussia, particularly among the school children. In many sections of Prussia small quantities of iodine have been administered in an artificial manner, with undeniably good results, though it is too early to draw any final conclusions from these

experiments. The observations will be continued, with great interest and attention.—*J. A. M. A.* 90:1726 (May 26), 1928.

The Age Incidence of Appendicitis Operations—A study of 766 consecutive appendicitis operations in the past 20 years at the Claremont (N. H.) Hospital showed that 41 per cent were in persons between 20 and 30 years of age, 21 per cent were in the 10-20 age group, 20 per cent in the 30-40 group, 7 per cent in the 40-50 group, 5.5 per cent were under 10 and 5 per cent over 50 years. The 20-30 age group also showed the highest incidence, about 32 per cent, in 6,568 cases reported by questionnaire from different parts of Canada and the United States. Four hospitals in New England, however, had the most cases, 38 per cent, in the ages between 10 and 20.

Of the 37 cases at the Claremont Hospital occurring in persons over 50 years of age, 22 were in such desperate condition that the operation was performed as an attempt to save the life of the patient. All of these 22 cases had suppuration in some form; some gangrene, some a large amount of free pus and some a well developed peritonitis. Twenty-four of these 37 cases were male and 13 female.

The mortality rates at the Claremont Hospital were as follows: all ages, 3.6 per cent; under 10 years 4.8 per cent; 10-20 years 2.3 per cent; 20-30 years 2.2 per cent; 30-40 years 2.0 per cent; 40-50 years 4.1 per cent; 50 and over, 21.6 per cent. The mortality rates reported in the questionnaires varied from 1.9 to 4 per cent for all ages and from 19 to 50 per cent in all persons over 50.—Emery M. Fitch, *Appendicitis in People Over Fifty Years of Age. New England J. Med.* 198:348-351 (Apr. 5), 1928.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

Methods Used by Oil Company Stop Pollution of Streams—At the El Segundo Refinery, the Standard Oil Company of California pumps about 20 million gallons of salt water daily from the ocean. The water is used for cooling purposes in the refining of oil. In its way through the refinery the water picks up a certain amount of oil from leaks and spills, etc. The oil is about 0.1 per cent of the volume of water used. This oil is removed from the water before latter is returned to the ocean. The article describes the method used in separating the oil and water by passing it through a tank or series of tanks or compartments and over skimming baffles. The action which takes place keeps the water and oil moving toward the surface, thus assisting and accelerating the movement of the oil to the surface where it is pumped off. The above plant removes all traces of oil from the water. Charles W. Geiger. *Water Works Eng.*, 81:90 (Jan. 18), 1928. Abstr. Frank Raab.

Deep-Pit Sludge Digestion at Indianapolis Sewage Works—Sludge is pumped at 7.72 and 1.12 per cent solids, respectively, to digestion pits. Pits are about 300 ft. square with a depth of 7 to 10 ft. The nature of the soil beneath the pits permits water to escape to such extent that it is only occasionally necessary to remove any quantity of free water, although skimming boxes are provided for the removal of liquor at any depth.

No chemical or temperature control is provided. A pit receives sludge until it is full, and the flow is then diverted to another pit until the first pit is lowered by filtration into the ground. This

brings about a series of intermittent fillings and effects some seeding. During filling periods pits become more acid, especially in cold weather.

Primary sludge enters the pit at a pH of about 6.8 and the activated sludge at 7.3. Under normal filling conditions the mixed sludge seldom drops during digestion below 6.8, and, on standing, without the addition of fresh sludge, goes to 7.8 and 8.0 in a short time. Above figures indicate conditions under which digestion usually takes place but hard and fast reaction and time figures cannot be given. Relative amounts of fresh and digested sludge and temperature govern the rate of reaction change.

A tabulation showing figures obtained in taking stock of sludge in the various pits is given. The large reduction in volume is attributed to the nature of the soil underlying the pits and the extent of digestion of solids to the long period of time involved, although the method of filling produces a mixture of some very old and some very fresh sludge in each pit. The mixture has never drained to less than 80 per cent of moisture and for the most part a moisture content of about 85 per cent obtains.

The author believes that as the proportion of activated sludge increases, satisfactory draining becomes more difficult and that drying beds will be required to put sludge in a condition to be handled. The present use of sludge by growers has not solved the problem of disposal but its use may be developed and extended as growers become familiar with its advantages.—C. K. Calvert, *Eng. News-Rec.*, 100:230 (Feb. 9), 1928. Abstr. C. H. Kibbey.

The Ozone Fallacy in Garage Ventilation—Dr. Salls presents a discussion of the literature concerned with the reaction of carbon monoxide and ozone, and from this discussion one must conclude that there is great variance in the literature concerned with this reaction.

The experimental studies which Dr. Salls presents are analyses of the atmosphere from a gassing chamber, in which carbon monoxide is mixed with ozone at room temperature. The atmosphere was sampled from the beginning of the mixture of the gases to a period 140 minutes thereafter. The carbon monoxide determinations were made by means of the Sayers-Yant method, using defibrinated steer's blood as a blood reagent. Three samples of the atmosphere were obtained prior to starting the ozonator, the three samples yielding the following results in chronological order: 13, 9 and 7 parts of carbon monoxide. After allowing the ozonator to operate for about 20 minutes, a sample was taken which yielded somewhat less than 5 parts of carbon monoxide. Subsequent samples were taken to the end of 140 minutes. When these samples were plotted against time they fell on a fairly uniform curve which appears to be the curve of absorption of gas by the chamber walls and leakage through them. The starting of the ozonator appears to have in no way altered the shape of the curve.

Dr. Salls concludes that this study indicated no evidence of an appreciable action of the ozone on the carbon monoxide.—Carroll M. Salls. *J. Indust. Hyg.*, 9:503 (Dec.), 1927. Abstr. Leonard Greenburg.

Preventing Excessive Smoke—One of the most important discriminations in the field of smoke abatement, so far as railroading is concerned, is the differentiation between smoke prevention and "smoke painting" or white-

washing. The latter is merely a method of discoloring smoke by means of wet steam or vapor, whereas the former, the correct method, requires improved combustion for its treatment. The author further points out that smoke burning or smoke combustion are misnomers because smoke already formed ordinarily cannot be burned or consumed. The greatest difficulty in avoiding smoke is usually on switch or transfer engines, owing to the nature of their work, and on road engines starting out from their terminal. Here it is necessary to rely on the blower and "smoke burner," by means of which additional air is admitted to the fire box, this air serving to prevent the formation of smoke. When the steam jets are used in the fire box without inducing the flow of additional air into the fire box, the steam jets merely serve to paint the smoke and not to prevent it.

In addition to this generous supply of air, a sufficiently high fire box temperature is necessary to prevent smoke formation. And finally, it is to be pointed out that the proper method of firing has considerable influence on smoke formation. Only a sufficient amount of fuel should be placed in the fire box at each firing as will insure proper combustion.—J. F. Bjorkholm. *Railway Age*, 84: 357 (Feb. 11), 1928. Abstr. Leonard Greenburg.

Iron and Manganese Removal at Wausau, Wisc.—This is a description of a 3-4.5 m.g. iron and manganese removal plant, costing \$125,000. Well water of poor physical character is being effectively treated by aeration, coagulation and sedimentation, and filtration. Final chlorination is not needed. The aerator consists of shallow wooden racks, holding 5 inch layers of coke and 2 inch layers of manganese dioxide ore, which are arranged in vertical tiers. The aerated water is dosed with 7.4 g.p.g. alum and 3.5 g.p.g. lime before dis-

charge through a baffled mixing chamber into a 45' x 45' x 16' Dorr clarifier, and then into three sedimentation basins, each 36' x 45' x 14' in size. Six rapid sand filters are fitted with porous concrete slab underdrains capable of passing 150 g.p.m. per sq. ft. Slabs are bolted to concrete stringers and have joints cemented. Slabs were made of $\frac{3}{4}$ to 1 inch gravel. A gravel layer of this size is used over slabs to depth of $6\frac{1}{2}$ inches; then one of $\frac{3}{8}$ to $\frac{5}{8}$ inch size for a depth of 3 inches; and then one of $\frac{1}{8}$ to $\frac{3}{8}$ inch size for a depth of 3 inches. Fine sand to depth of 28 inches is placed upon gravel. Complete control and recording apparatus is provided. From $2\frac{1}{2}$ to 3 per cent wash water is used, which is somewhat high because considerable fine floc reaches the filters.—Emil Flatter. *Am. City* 38:125 (Mar.), 1928. Abstr. C. R. Cox.

A New Larvicide for Mosquitoes
—The authors experimented with chemically pure borax, with crystalline and calcined sodium borate, and with commercial borax. The latter was found to be as efficient as any. After experimenting with various concentrations, the authors conclude that ordinary borax in the concentration of 1.5 gm. per liter of water proved an efficient larvicide for mosquito larvae. This retains its action for long periods of time in wooden pails. Borax did not stop egg laying and hatching, but in no case did the young larvae live for more than 2 days.

They quote reports that borax pools do not produce mosquitoes and that, in a borax country, this substance is not absorbed into the ground but crystallizes

on evaporation of the water and is ready for the next rain. The authors suggest that there is a field of usefulness for borax as a larvicide, in such places as fire barrels, etc.—Robert Matheson and G. H. Hinman. *Am. J. Hyg.*, 8:293 (Mar.), 1928. Abstr. L. L. Williams, Jr.

The Rôle of Ammonia in the Purification of Water—During the 1925 maneuvers of the British Army, Major Harold introduced a new method of purifying water. This method assisted in preliminary treatment with ammonia followed by sterilization with chlorine. In this way the absorption of chlorine is restrained and its germicidal powers are enhanced. The sterilizing agent is not unduly deviated by organic matter and a safe water is produced, practically free from unpleasant tastes. The chlorine solution was given initial contact with the ammonia prior to dosing into water and the highest concentration which did not show evidence of available chlorine was fixed upon as the optimum. Two compounds were produced by the interaction of 1 equivalent of chlorine with $\frac{1}{2}$ an equivalent of ammonia. In a foul water containing urine and nitrites in unreasonable amount some absorption of mono-chloramine was evident but with all casual waters encountered a dose of 1 p.p.m. has always sufficed. Dichloramine is slower in action but possesses greater stability than mono-chloramine. Normally each water cart having a capacity of 110 gal. is dosed with 1.25 gm. of ammonium bicarbonate and about 3 gm. by weight of dry chlorine gas.—C. H. H. Harold. *J. Roy. San. Inst.*, 48:484 (Mar.), 1928. Abstr. W. L. Havens.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M.D., AND LEONARD GREENBURG, PH.D.

Industry and Public Health—One concern employing 4,500 employees found, before instituting medical service, that they were losing from cost of illness due to sickness \$67,500; cost of absence from sickness, \$150,000; production loss from sickness on the job, \$50,000; loss to workers in wages, \$162,000; loss through reduced earning capacity, \$40,000; medical expense to workers, \$45,000; public expense and charitable relief, \$56,000; total, \$570,500.

The justification for industrial medicine lies not only in the reduction of absences from sickness, but also in the prolongation of lives of usefulness of the older and more experienced employees. We have no statistics on this subject, and it will be a long time before the ultimate effect can be appraised.

Statistics further show that the average industrial worker is absent from duty 6 to 9 days each year due to insignificant ailments. In the case of salaried workers this loss falls wholly on the industries; while in the case of hourly paid workers the loss is divided—the worker losing the wages, the concern the output.

When absenteeism lasts so long as to require workers being replaced, the loss to the industries increases heavily. Estimates vary as to the cost of hiring an employe, but besides the first cost, wastes of one kind and another are involved. Often the worker is no better in health than the one replaced. The accident hazard is increased, output lessened, and defective work increased. Here is another economic reason why big business is interested in health.

As to results accomplished from the direct application of health work to in-

dustries, the Metropolitan Life Insurance Company's figures are probably more accurate than any others we have. Its statement for the year ending December 31, 1926, shows that lives saved among industrial policy holders from 1911 to 1925 in excess of general mortality improvement numbered 240,000; lives saved among policyholders in 1926, as compared to the death rate in 1911, numbered 63,330. In other words, by the application of protective health measures to industrial workers it paid 63,330 fewer death claims. This means that not only fewer death claims were paid, but it also means happiness and well-being for thousands of families.—T. F. Abercrombie, Proceedings of the Fourteenth Annual Meeting of International Assoc. of Industrial Accident Boards and Commissions, Atlanta, Ga., Sept. 27-29, 1927, *U. S. Dept. of Labor, Bur. of Labor Statistics. No. 456*, Feb., 1928, p. 135.

Cancer Statistics as They Appear to a Pathologist—The author presents many arguments bringing him to the conclusion that the increase in the cancer rate is just about the same as the increase of the other three common causes of death in those who have passed the prime of life; namely, cerebral hemorrhage, nephritis and heart disease. Also diabetes, which is chiefly an old age disease shows the same trend. "I find myself unable to accept anything about cancer as finally established by statistics."

I am not by any means sure that changes of habits and occupations may not be having some influence on the incidence of cancer. For example, a smaller proportion of the population are now engaged in outdoor occupations,

which theoretically favor the development of cancer of the skin of the face. Chimney sweeps' cancer may be decreasing or vanishing with modern house construction and heating in the countries where it once occurred. Bladder cancer may be increased as an industrial disease through the development of dye factories. Perhaps changes of diet or culinary technic may influence the occurrence of cancer of the stomach—but in which direction there is no reliable evidence. There seems to be little doubt that primary cancer of the lung is now a more common disease in Europe and America than it was even ten or fifteen years ago. If this is a sequel of influenza, as some believe, the increase should be transitory; but if it is the result of irritating chemicals from industrial processes, or the dust from tarred roads, which are among the possible exciting causes, the increase in this form of cancer may become permanent and significant. So perhaps there are changes in the incidence of cancer, independent of the increased age level of the population. My object is not to deny the existence of an increased incidence or to establish the existence of a decreased frequency, but merely to indicate how unconvincing the evidence appears to one whose daily observation impresses him with the inaccuracy of the recorded statistical data.

—H. Gideon Wells, *Studies from the Otho S. A. Sprague Memorial Institute*, Collected Reprints, Vol. XV, 1927, 31 pp.

Caring for Injured Workers—This *Bulletin No. 82* of the Series of Safe Practices Pamphlets discusses the necessary equipment and attendance for first aid and other care of injured workers. The article is profusely illustrated and has been prepared by a special committee having the benefit of great experience in accident prevention and first aid. The report is in the form of a code.—*National Safety News*, Mar., 1928, pp. 23-32.

Iron Foundry Workers Show Highest Percentage of Deaths from Pneumonia—This article presents a table covering 15 occupations which shows deaths from pneumonia standardized for ages 15-64 years with iron and steel molders and foundry workers at the head, having a percentage of 17.6 as against the next in order, cordage and kelp mill operatives, with a percentage of 14.8. Coal miners (underground) have a percentage of 12.0 deaths due to pneumonia in all cases of death. Coal miners (underground, except coal) are at the foot of the list with 9.4 of deaths due to pneumonia. The article points out that only 7.7 per cent of deaths among all occupied males are attributed to pneumonia. For iron foundry workers the percentage of deaths is well above the average at every age from 15 to 64 years. In the age period 25-34, it is over three times the average. Pneumonia was the chief cause of death among them. This is true of no other occupational class included in the Metropolitan investigation. The article notes that the workers listed in the table have three distinct types of hazards; namely, dust, extreme heat, and sudden variation in temperature and exposure to weather. Similar comparisons with ten occupations in the British industry show the highest death rates from pneumonia in order of magnitude as brass foundry laborers, grinders and cutlers, stevedores, cotton glow room operatives, iron foundry furnace men and laborers, cotton carders, puddlers, metal polishers, and "other" dock laborers.—Metropolitan Life Insurance Company *Statistical Bulletin*, IX, 3:1 (Mar.), 1928.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Vitamins of Orange Juice—Only recently has investigative work shown that orange juice contains other vitamins than the antiscorbutic C. The juice was obtained from ripe California oranges which were peeled before pressing to obviate contamination of the juice by the oil known to be rich in vitamin A. The juice was filtered free from cell tissue. Doses of orange juice, 7.5, 5.0, 2.5 c.c. respectively in the case of rats which had evidence of vitamin A deficiency by development of xerophthalmia, indicated that the dose of 5.0 c.c. or more met with prompt response, while the animals receiving 2.5 c.c. died in 3 weeks from vitamin A deficiency. This was confirmed by a second experiment, employing positive and negative controls, positive being supplied with potent cod liver oil. The negative control died and experimental animals receiving 5 c.c. orange juice compared favorably with the positive in appearance and as indicated by autopsy. Preliminary experiments show that doses of 5 c.c. orange juice were insufficient to supply rats with vitamin B. This was checked with positive and negative controls, the positive controls receiving an equivalent of 0.6 gm. of marmite extract. Animals receiving daily doses of 7.5 c.c. of fresh juice showed a tendency to fall off in growth after the third week. The dose was raised to 10 c.c. which was continued and there was little difference between these animals and the positive control. The autopsied rats were normal. The juice was tested for vitamin D by the Zucker technic in which the fecal reaction is made alkaline by rachitogenic diet. Antirachitic substances fed at this time convert the reaction to acid within 3 to 4 days, and the per-

sistence of alkalinity is regarded as indicative of the absence of vitamin D. After feeding doses of 10 c.c. per day of fresh orange juice for 2 weeks the fecal reaction was still alkaline. Supplements of cod liver oil potent in vitamin D changed the reaction to acid within 4 days, but of those on orange juice it remained alkaline, indicating probable absence of vitamin D. While the author concludes that the study on vitamin D should be repeated, it was pointed out that chemical experiments showed that children may develop rickets even when taking appreciable amounts of orange juice.—S. G. Willimott, *Biochem. J.* 22:67, 1928.

Iron in Nutrition. VI. Iron Salts and Iron-Containing Ash Extracts in the Correction of Anemia—A series of experiments is recorded, undertaken for the purpose of correcting a nutritional anemia developed in young rats in a stock colony which were weaned at from 3 to 4 weeks of age (50 to 60 gm. weight), and placed on a diet of cow's milk, anemia being characterized by very low hemoglobin levels. The effects of inorganic iron salts were studied, making use of a commercial chloride and a C. P. ferrous ammonium sulfate. The iron salts were fed at a level of 2 mg. of iron daily, 6 days a week, and later at a level of 0.1, 0.15, 0.5, and 1.0 mg. In no case did these small additions of iron correct the anemic condition, and all of the animals died after showing only slightly increased hemoglobin. The effect of iron in the form of ash and dried lettuce was also tried. The first feeding represents a level of 1 gm. of dried lettuce daily, 6 days a week, which was quite effective in

correcting anemia. Beef liver, kidney, and muscle, yellow corn, and wheat were selected for another experiment. The quantities of these animal tissues were sliced, dried, and ground and the corn and wheat were finely ground. All materials were fed at levels of 0.5 gm. per rat 6 days per week. This level in the case of beef liver introduced about 0.15 gm. of iron. Beef liver resulted in steadily increasing hemoglobin formation as well as good growth and physical appearance. Beef kidney was less favorable and beef muscle practically inert. Corn and wheat were less valuable and in most cases the animals died. Further experiments were initiated to determine reasons for the effectiveness of liver material. Various salts of iron, chloride, sulfate, acetate, citrate, and phosphate were prepared. These salts were fed at a level of 0.5 mg. 6 days per week. All of these salts failed to increase materially the hemoglobin, the majority of the animals dying in 4 to 8 weeks. Hydrochloric acid extracts of the ash of lettuce, yellow corn, and beef liver were made. These were compared in feeding experiments with ferric chloride and with the ash of liver ignited with calcium carbonate and were fed in such amounts as to furnish practically 0.5 mg. of iron. Marked hemoglobin regeneration resulted in all cases except with the addition of ferric chloride alone. It is concluded as a result of data that in addition to the iron which is essential the ashes and extracts of the ashes of corn, lettuce, and beef liver, contain some other substance necessary to restore hemoglobin, evidently inorganic in nature.—J. Waddell, C. A. Elvehjem, H. Steenbock and E. B. Hart. *J. Biol. Chem.*, 77:777 (May), 1928.

VII. Copper as a Supplement to Iron for Hemoglobin Building in the Rat—In the course of the study of the effect of iron salts on anemia (see preceding abstract) investigators obtained

a commercial preparation of liver which has proved effective in the treatment of pernicious anemia. This preparation is fed at a 3 gm. level, 6 days per week and at the same level supplemented with 0.5 mg. iron as ferric chloride. All animals responded, slightly better results being evident in those receiving the iron supplement. The ash and a hydrochloric acid digest of the ash were fed to anemic rats at approximately the same iron level and were found effective in correcting the anemia. The ash of a commercial liver preparation was fractionated into three parts, hydrogen sulfide precipitate, hydrogen sulfide—ammonium sulfide precipitate, and filtrate. The precipitates after solution in acid were evaporated taken up with water and, together with the evaporated filtrates suspended in water were fed at levels representing 0.3 gm. of the original preparation. The hydrogen sulfide fraction alone was potent. Previous to this experiment, the effect of copper as copper sulfate had been tried by addition to the whole milk diet, as a result of observing a pale blue color in the ash of some material which had been studied. The effect of this salt on one single animal feeding was remarkable as indicated by the weight record and hemoglobin curves. This suggested that the hydrogen sulfide fraction of the liver ash was the one containing the most copper and for that reason particularly potent. Experiments were undertaken with copper feeding at levels of 0.01, 0.05, and 0.10 mg. of copper as the dose per rat, giving 0.05 mg. of iron as ferrous chloride in addition. In the 0.05 and 0.10 mg. levels of copper, rapid recovery was noticed. A determination of the copper content of the commercial liver preparation showed 0.016 per cent copper. A discussion as to the presence of copper in the animal organism and the probable manner in which it functions conclude with the suggestion that it may act as a catalyzer for certain reac-

tions concerned in hemoglobin building and that the work emphasizes the necessity for a more intensive study of the effects of small amounts of inorganic elements in nutrition.—E. B. Hart, H. Steenbock, J. Waddell and C. A. Elvehjem. *J. Biol. Chem.*, 77:797 (May), 1928.

Chemical Composition of the Milk of Cows Receiving Cod Liver Oil—

This is a preliminary paper, recording experiments carried on over a period of 5 months, on 4 cows which received cod liver oil and peanut oil, all on similar rations. The quantities of the oils administered are given and also the complete analyses of the milk from the cows. Results indicate that the cows receiving cod liver oil produced milk which contains an increased percentage of total calcium. Results are regarded as insufficient to justify definite conclusions but the fact that previous investigations have shown that butter from milk of cows on cod liver oil supplement is much more antirachitic than butter from cows not receiving cod-liver oil, probably warrants further study which is in progress.—Elfrida Constance Victoria Mattick, *Biochem. J.* 22:9, 1928.

Studies On the Effect of Heat On Milk. IV. The Iodine Content—

This work was undertaken in view of the reports that the reduction in the soluble calcium in milk by heat adversely affects metabolism and may eventually give rise to rickets in young animals and in children. Cod liver oil is stated to improve the growth promoting properties of heated milk. Since this is rich in iodine this study is suggested. Sep-

arated cow's milk, fresh, pasteurized, and boiled, was prepared and the iodine determined by the Leitch-Henderson modification of Fellenberg's method. The iodine averaged in micro-milligrams per 100 c.c. 5.69 for fresh, 4.51 for pasteurized, and 4.23 for boiled.

Both cow's milk and goat's milk were dialysed in determining the amount of iodine diffusible. It was practically the same in both, or 83 per cent of total iodine.—Hugh Edward Magee and Agness Elisabeth Glennie, *Biochem. J.*, 22:11, 1928.

Value of Whole Potato in Human Nutrition—

Reference is made to the work of Hindhede who, with his collaborators, was able to live over long periods of time in which nitrogen was derived solely from the potato. His investigation is here repeated, continuing the experiment for several months. The subjects were two healthy adults, a man aged 25, and a woman aged 28, both doing laboratory work. The diet consisted of potato with butter or pork fat with the addition of apples, pears, tea or black coffee with sugar. The amount of fat consumed was from 120-150 gm. daily. Potatoes were steam-cooked. The experiment extended over 167 days and the nitrogen balances are submitted. The nitrogen content of the potatoes was 0.34 per cent. Nitrogen equilibrium was attained by both subjects and a daily intake of nitrogen was slightly under 5.6 gm. for the man and 3.5 gm. for the woman. The authors conclude this is a confirmation of Hindhede's experiments, indicating the high value of potatoes as a sole source of nitrogen for the human adult.—Stanislaw Kazimierz Kon and Aniela Klein, *Biochem. J.* 22:258, 1928.

CHILD HYGIENE

MERRILL E. CHAMPION, M. D.

Tuberculosis in Infancy and Childhood—The time is coming, says Dr. Shapero in his article with the above title, when we can expect to see the control and perhaps the elimination of tuberculosis. This will be brought about by attention to the disease in the child. The author's conclusions are worded by him as follows:

1. Tuberculosis is usually due to human tubercle bacilli and most often gains entrance by inhalation. Inheritance plays practically no part in the perpetuation of this disease.

2. Bovine infection occurs in 25 per cent of the cases and is oftener present before than after 5 years of age.

3. Contact with tuberculous patients is of preëminent importance in the spread of tuberculosis. Milk plays a minor rôle. The earlier the contact, the more likely the infection develops; the earlier the infection occurs the greater are the chances for disease production and, furthermore, the earlier the disease, the graver becomes the prognosis.

4. A positive tuberculin reaction in the older child does not necessarily mean disease, but denotes past infection. A positive reaction is obtained in 80 to 90 per cent of all children under 15 years. Under 2 years a positive reaction usually signifies disease.

5. The child mortality under 12 is directly due to tuberculosis in 15 to 30 per cent. The mortality from pulmonary tuberculosis has diminished, but meningeal and miliary tuberculosis still play havoc with the infant. The prognosis is better at present than it formerly was.

6. The symptoms of tuberculosis are as a rule disturbances of nutrition and general well-being.

7. The X-ray is of great assistance in diagnosing this condition.

8. Heliotherapy and tuberculin are beneficial in selected cases when used with proper care.

9. There is neither an absolute nor a natural immunity to tuberculosis, skin sensitiveness resulting only after infection.

10. The prevention of tuberculosis in infancy and childhood depends on avoidance of contacts under the age of 2. There should

be a careful supervision of the milk supply. If prevention is at any time possible with Calmette's B.C.G., the most fruitful time for such is just following birth. Measles and pertussis should be prevented in infancy as these usually light up an infection and produce disease. The most favorable time of exposure is between 3 and puberty since the lymph glands function best at this time.

11. Physical defects such as posture, dental caries, hypertrophied diseased tonsils should receive attention and correction.

12. The time is not far distant when tuberculosis will be better controlled and possibly eliminated.—

Tuberculosis in Infancy and Childhood, A. A. Shapero, M.D., *Arch. Pediat.*, May, 1928.

The Health of Rural School Children—Dr. James Frederick Rogers of the Federal Bureau of Education describes Ten Steps in the Promotion of Health in Rural Schools. Starting out as Step One, with a real desire for health as a genuine as well as theoretical objective in education, he goes on to enumerate as Step Two the backing of the board of education and support of local groups such as Parent-Teacher Associations, physicians and dentists. Then follow the distribution of educational leaflets; utilizing existing agencies; surveying the school plant to decide what changes are needed, and acting on the recommendations which come to the fore after the survey has been completed. Step Six involves health examinations, both medical and dental. Step Seven translates the results of the physical examination into active participation in the formation of health habits. Step Eight has to do with the improvement of the nutrition of the child through the employment of the school lunch. Step Nine brings us to the playground as a

field of activity for physical education. Lastly, Step Ten has to do with the type of expert supervision which should be given to keep the health program moving forward as rapidly as it should.—Ten Steps in the Promotion of Health in Rural Schools, James Frederick Rogers, M.D., *School Life*, XIII, 10 (June), 1928.

Baby Week in the East—From far off Delhi in India comes the story of an annual Baby Week held in a nice shady garden under the walls of a fort. Not only were the babies themselves present but there were exhibits showing what the normal baby needs to keep him well and comfortable, food charts, and even a laundry demonstration. A model street with a covered well, a bin for refuse, and clean shops where protection from flies was carried out, was contrasted with the ordinary dirty Indian street with all that accompanies it. The element of competition is brought in through an annual reward of a silver cup for the most effective local health and Baby Week campaign held anywhere in India.

Maternal Mortality—Investigations into the causes of maternal mortality have become less uncommon in this country than they used to be. They apparently do not arouse any undue amount of antagonism on the part of the practicing physician, provided these studies are carried on with discretion.

The *Journal of the American Medical*

Association, however, reports a joint letter to the *London Times* from leading obstetricians who deprecate the suggestion that the local health authorities undertake an investigation into the lack of reduction of mortality of childbirth. The point they make is that this type of study is not likely to offer any solution of the problem, since in their opinion it is in the nature of an attempted short cut to a solution which has baffled explanation throughout the world for many years.

It is well recognized by these critics that puerperal fever is infectious but they maintain that it is still a matter of controversy as to what proportion of cases arise from a latent infection within the patient herself and what proportion from infection carried to the patient. There is also the problem of the factors which determine susceptibility to infection and of the part played by lowered resistance of the patient. Certain anomalies are pointed out: why should a rapidly fatal infection follow an absolutely natural childbirth at times, while an uneventful recovery may follow complications of a nature to arouse expectation of unfavorable results. Toxemias too have their puzzling aspects.

The conclusions which the practicing obstetricians reach are that a close alliance is needed between the physician, the biochemist and the bacteriologist, and also financial assistance for the establishment of clinics and laboratories.—*Foreign Letters, J. A. M. A.*, May 19, 1928.

Prize Competition for a Book on Child Hygiene

THE Royal Society of Hygiene of Milan, Italy, has announced a prize competition, open to the physicians of Italy, for the best handbook on the hygiene of children between the ages of

7 and 15 years. A prize of 5,000 lire will be given to the winner. This book is to form a part of a series on maternity and child hygiene.—*Pediatrics*, Naples, Dec. 15, 1927, p. xxxii.

PUBLIC HEALTH NURSING

MIRIAM AMES, R. N.

Portable House for Office and Health Center—The *Health News* of the New York State Department of Health, has an account of the way an ingenious nurse in Putnam County, N. Y., solved the problem of headquarters. The suggestion might well be followed by other county public health nurses in the great open spaces where, seemingly, office spaces are frequently lacking.

The idea of having a portable house for use as a combined office and health center was fostered by the nurse and eagerly embraced by the committee on nursing activities after eliminating all other possibilities. The enthusiastic group purchased for \$664.00, including delivery, a house 18 by 21 feet. On land loaned for the purpose, interested members of the community assisted in putting up the structure.

The house was lined with sheet rock as a protection against the cold weather, and a stove was found to heat the building adequately for the monthly health conferences. It was wired for electricity, and the outside given two coats of white paint. Practically all the furnishings were donated. The total cost of the house, exclusive of equipment, was \$1066.00.—Public Health Nurse Uses Portable House for Office and Health Center, *Health News* New York State Dept. of Health 5, 23:90 (June 4), 1928.

The Frontier Nursing Service, Inc.—The Third Annual Report of the Frontier Nursing Service, Inc., is contained in the *Quarterly Bulletin* for June. This booklet of 60 pages gives a detailed account of the financial status of the organization, a statistical summary of the nursing service for each center and a list of the contributors. The

latter lists impartially gifts ranging from veterinary advice to thousands of dollars.

Something of the struggles of the first two years we know. One brief paragraph in the foreword sums up the progress which has been made in construction during the past year.

The work of the Service has been greatly augmented by its building program during the past year. The Up River Center (Jessie Preston Draper) is finished; the Possum Bend Center (Frances Bolton) was entirely built; the Hyden Hospital and Health Center has been carried nearly to completion, and the preliminary arrangements are made for the new center (Clara Ford) in Clay County, on Red Bird River near the mouth of Big Creek.

The hopes for the future health of the citizens of Leslie County lie in these rugged strongholds, through which the nursing service is administered. The centers are all located on mountain trails, anywhere from 6 to 34 miles from the railroad.

The new hospital and health center at Hyden, Ky., is within a month of completion. It is to have two wards of 4 adult beds each, with space for as many children's beds, and for at least 25 additional patients for special clinics. An operating room, a laboratory for the health officer, a dispensary and waiting room, and suitable kitchens, supply rooms and baths are listed among the special features of this new structure. Sleeping quarters and living quarters are provided for the nurses of the district service, the supervisor and a book-keeper.

Note: Previous to the Biennial Nursing Convention at Louisville, Mrs. Breckinridge issued a cordial invitation to the nurses who were attending the convention to visit the centers. Twenty-five guests could be accommodated and the visitors were to travel from

the railroad to the various centers either on horseback or by mule teams.

Who can foresee what this taste of frontier life will do toward enlisting staunch support and even recruits for service. A sense of romance and love of adventure still appeals to nurses, young and old.

Preschool Education—The major part of the June number of *The Public Health Nurse* is devoted to an interesting discussion of the present-day movement in preschool education. In the leading article, Education of Preschool Children, Dr. Lois Hayden Meek, Educational Secretary of the American Association of University Women, describes the different phases of the movement which have been developed in adapting education to the tiny child's needs. With the acceptance of the discoveries of psychologists that the formation of a child's personality and character begins at birth and is well on its way to good or bad by the time the child enters school, and that in teaching, the life of the child must be considered as an integrated whole, there has come a marked change in educational methods.

Nursery schools have developed in ever increasing numbers, modelled first on the English plan, but gradually being changed to meet American needs. Here the child's life, play, health habits, contacts with others, all the daily mental and emotional experiences are under the guidance of a trained, understanding person during the hours of school. But with the recognition by both parents and educators that those hours constitute but part of a child's day and that the greater part of his training still goes on at home, a concerted effort has been made to provide for parental education at the same time. Individual conferences over individual child problems, group discussions, lectures, and selected readings about the various needs of a growing child have been tried successfully in many places.

For special behavior problems, many

communities now have behavior clinics under trained psychiatrists, while medical clinics are used for all children for the maintenance of physical health which is fundamental to any sound growth.

Many nursery schools are also training centers for teachers, and as we are becoming better equipped with well rounded-out nursery school centers, more and more teachers are taking their entire training in this country.

In a field so new, we are not yet completely equipped with a background of exact knowledge about the life of the normal child. Therefore, highly important in the new educational movement are the research studies which are being made of child behavior and normal development, mental, physical, emotional and social, with interpretation of them from the basis that "the child's life is an integrated whole."

Anna Heisler, of the American Child Health Association, in the next article, Classes in Child Care for Children, discusses ways that are being tried to provide a preparation for the coming generations of mothers by teaching the fundamental principles of child care to girls in school. Perhaps ultimately the public school curriculum will include classes in child care for young girls and boys, with proper training of teachers for presenting this subject. Already some states report courses for teachers in infant or child hygiene. Wisconsin, particularly, has adopted a slogan "Every Girl Educated for Intelligent Motherhood," and the Bureau of Child Welfare, the State Department of Public Instruction, the State Board of Vocational Education, and the State Board of Normal Regents are combining in an effort to provide adequate courses in infant and child hygiene for school girls.

In home economics courses in many states, instruction in child care is included.

Apart from such formal teaching,

which has not been extensive, much has been done through Little Mothers' Leagues and Red Cross home hygiene courses to give young girls an opportunity to learn some of the fundamentals of sound motherhood.

In an article by Isabel W. Baker, of the American Red Cross, *Bringing up Good Husbands*, it is shown that not only girls but also boys are responding eagerly to home hygiene classes and are learning how to care for little children.

There are other articles, one suggesting functions for the public health nurse in the nursery school, and one describing the nursery school at Vassar College, which is being conducted in connection with the Department of Euthenics.—*Pub. Health Nurse*, 20, 6 (June), 1928.

News from the Biennial—We have heard from good authority that 4500 nurses registered at the convention. Forty-eight states were represented, as were also Canada, Cuba, Porto Rico and Hawaii. Eighty lay members of public health nursing associations were in attendance with representation from 22 states.

The following were elected officers and directors of the National Organization

for Public Health Nursing for the next 2 years:

President—Anne L. Hansen

Vice-President—Winifred Rand

Second Vice-President—Sophie Nelson

Directors—Nurse Members—Alta E. Dines, Ann Dickie Boyd, Gertrude Bowling, Grace Ross

Directors—Sustaining Members—Mrs. Chester C. Bolton, Mrs. C.-E. A. Winslow, Anna Huber, Mrs. John A. Haskell, Dr. Ira V. Hiscock

Nominating Committee—Mrs. T. Kraker Guthrie, I. Malinde Havey, Naomi Deutsch

Dr. May Ayres Burgess, Director of the Committee on the Grading of Nursing Schools, presented her report in a masterly way. The complete report may be found in Dr. Burgess's book—*Nurses, Patients and Pocketbooks*.

A Lay Members Section in the National Organization for Public Health Nursing was formed and is an important feature of the Louisville Biennial. The adoption of a Manual for Board Members will standardize the form of organization and of boards and committees.

The Public Health Nurse will contain more complete reports of the section meetings.

Milwaukee has been selected as the city in which the 1930 Biennial Convention will be held.

Open Air Schools

AS a means of improving the health of underfed or sickly children of school age, 3 open air schools have been established in Montevideo, Uruguay. These schools are situated in parks on the outskirts of the city. The school physicians select the children for admission to them. The children spend from 6 to 8 hours a day in the schools, summer and winter. The program is arranged so that class periods alternate with rest periods in

bed, both of which are held in the open air.

The children are weighed weekly, measured quarterly, and health records are kept, also nourishing meals are provided.

The three schools accommodate 600 children, whose average stay is 6 months.—*Boletín del Instituto Internacional Americano de Protección a la Infancia*, Montevideo, Oct., 1927, p. 199.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

Your Publicity Program for 1929—The steps to take in preparing a year round program of health publicity will be discussed in a meeting which will run through two sessions of our section program at the A. P. H. A. convention in Chicago next October. In preparation for this meeting the program committee will welcome copies of publicity plans or outlines used by health departments and health organizations. Send to the editor of this department.

In a series of brief talks speakers will analyze the problems which come up when publicity is in the planning stage. On what basis do you choose your objectives? How select and classify your audiences? What tests of reliability and appropriateness determine your choice of talking points? How will you find the best method of approach to your audience? Which of the 57 varieties of publicity methods will you use? How prepare a schedule or calendar? Come and take part in the discussion and also make this meeting an occasion for starting to map out your 1929 program.

A New Weapon Against Typhoid
—State departments and state associations are provided with some good material in the recent news from Albany, N. Y. As discussed in the Law and Legislation Department (Apr. and June, 1928), the City of Albany must pay damages because of disease contracted through the municipal water supply.

The immediate strategy is to give widespread publicity to the mere fact of those awards being given by the courts. The more people know the pos-

sibility of such damage suits from typhoid victims the better will state or local forces seek safer water supplies.

MOTION PICTURES

Seven half day showings of general health and mouth hygiene pictures at the American Dental Association meeting, Minneapolis, Minn., Aug. 20-23 will give an opportunity to see many of the old and new films. Write to 58 East Washington St., Chicago, Ill., for detailed program.

The cartoon film, *Health Twins at Work*, which was made for the American Social Hygiene Association several years ago, has been edited and brought up to date, with its main interest centered on tuberculosis.

The scene opens on a courtroom where the judge, representing Public Opinion, presides. Two sprightly clever little men, the public health twins, are introduced respectively as Science and Administration, with the explanation that "the control of disease depends upon science and administration." The judge orders the three culprits, tuberculosis, infantile diarrhea, and diphtheria to stand before him, and when they have taken their places, all else of the scene except the three prisoners fades out and the caricature of tuberculosis slowly dissolves into a vertical bar. In quick succession the other two figures are likewise transformed into vertical bars, the resulting pictures being a bar graph of the mortality rates of the three diseases in 1900, each bar being carefully titled and of proper height in relation to the other.

Prints may be purchased through the American Social Hygiene Association, 370 Seventh Ave., New York, N. Y.

AWARDS

An Honor Roll of Cities having no accident fatalities during the preceding month is published in *Public Safety*, National Safety Council, Chicago, Ill.

*The author is not a member of printed matter. He is a member of the American Society of Public Health, 112 East 22d St., New York, N. Y.

In the belief that there is no sharper tool of social and civic betterment than a cartoon which combines a penetrating idea with good art, the Harmon Foundation offers through *The Survey* 16 awards for cartoons during the year beginning April 1, 1928. The only restriction as to subject is that the cartoons must, in the opinion of the judges, bear a direct relation to subjects which tend to make of our American communities better places in which to live and to work. An award of \$250 to be made quarterly and three awards of \$50 each, also to be awarded quarterly, are described in the announcement. Address, Harmon-Survey Cartoon Awards, 112 East 19th Street, New York, N. Y.

Wild West, by Viola Paradise. *Pictorial Review*. April, 1928. This short story won first place in the contest conducted by the Committee on Publicity Methods in Social Work. Based on the author's field experiences while with the Children's Bureau the story develops in dramatic fashion a phase of the need for rural maternity service. Miss Paradise has had numerous stories and articles in *Colliers*, *Harpers*, *Atlantic* and *Forum*.

NEWSPAPERS

Again *Editor and Publisher* issues its International Year Book edition with lists of dailies in many countries; city and Sunday editors named for many United States and Canada dailies; numerous classified lists; art and literary markets in the United States; books, schools, syndicates, mat and cut services, etc., 352 pages 10 by 13 inches. Jan. 28, 1928. Times Bldg., New York, N. Y. \$4.00 with year's subscription.

Fair and wise policies in dealing with the newspapers in emergencies are outlined in "Helpful Relations with Local Newspapers," by F. H. Williams. *Trained Nurse*. Oct., 1927. Especially important are the detailed suggestions as to information to be supplied in writ-

ing, and the handling of telephone interviews.

HONORABLE MENTION

Health, New Hampshire State Board of Health: for list of contents on cover page.

Fifth Annual Report of Quebec Provincial Bureau of Health: for a table of contents (called an index).

REQUESTS

Outline diagrams of the digestive tract are desired by Mabel Milhan, Home Demonstration Agent, Canton, N. Y. Please send your answer also to editor of this department.

Copies of posters and other material, as well as suggestions helpful in preparing a health exhibition will be appreciated by Dr. T. N. Mazumdar, Health Officer, Calcutta, India.

"On the average, what proportion of a welfare or nursing budget do you think might well be devoted to publicity purposes?"

Copies of The Cheapest Health Insurance, a 4-page folder, are sent by Dr. Robert E. Plunkett, Division of Tuberculosis, New York Department of Health, Albany, N. Y., in response to a "request" in the May issue. It embodies an interesting idea for boosting health examinations which is used in connection with consultation chest clinics. Whenever the family history shows illness at home, copies of the folder are given to the patients for the sick ones.

The Association of Social Workers, Prague, Czechoslovakia, is planning "an exhibition of posters representing the propaganda for social service" in different countries. They say:

It would be a great honor for us if your association would be represented by placards and posters which you may have issued, and we beg you therefore to kindly send us copies. We, of course, agree to pay all expenses regarding postage, etc., etc., or if preferred would send copies of our posters in exchange.

Please tell the editor when you mail your posters.

LAW AND LEGISLATION

JAMES A. TOBEY, LL.B., DR. P.H.

A Plan for Federal Child Welfare Extension—The original Sheppard-Towner Law, or, more properly, the Federal Maternity and Infancy Act, was passed on November 23, 1921, to take effect for a 5-year period ending June 30, 1927. Near the end of this period, Congress was importuned to continue the operation of the act for several years and after considerable wrangling agreed to a 2-year extension, but with the understanding that the law would positively cease on June 30, 1929. Both sides agreed to this.

During the closing days of the first session of the Seventieth Congress a bill, H. R. 14070, to provide a child welfare extension service in the federal government, was introduced by Representative Newton of Minnesota. This measure authorizes an annual appropriation of \$1,000,000 for the purpose of paying the expenses of a new division in the U. S. Children's Bureau. Only \$50,000 would actually be used for the administration of this service, the remainder of the million dollars being allotted to the states to promote the welfare and hygiene of mothers and children and aid in the reduction of infant mortality.

This proposition differs from the Federal Maternity and Infancy Act in that the states would not be required to match the federal funds, but the state, territorial, county, and municipal agencies, or child welfare associations could make voluntary appropriations for the purpose.

An Advisory Committee on Maternal and Child Welfare would be created by this proposed law. The committee would consist of the Surgeon General of the U. S. Public Health Service, the U. S.

Commissioner of Education, the Director of Extension Work of the Department of Agriculture, and the Chief of the Children's Bureau, as *ex-officio* members, and 5 other members to be appointed by the chief of the Children's Bureau, with the approval of the Secretary of Labor. These members would be from without the federal government and at least one would be required to be a state health officer.

The bill stipulates that no funds appropriated under the act could be used for buildings, lands, pensions, or gratuities, and also that no agent of the Children's Bureau could enter any house over objection of the owner.

This measure was referred to the Committee on Interstate and Foreign Commerce of the House, and will be before the second session of the Seventieth Congress when it convenes next December.

Indian Health Needs—Sanitarians have long recognized the fact that the health of the Indians is thoroughly bad compared with that of the general population. The fact has been confirmed and emphasized in an impartial report on the problem of Indian Administration which has been recently issued by the Institute for Government Research of Washington, D. C. as the result of an extensive survey made at the request of Dr. Hubert Work, Secretary of the Interior.

In this report of some 870 pages, 155 pages are devoted directly to the health of the Indians and the medical and sanitary activities of the Indian Service. Appropriations for health are stated to have been inadequate and the personnel on this work insufficient, underpaid, un-

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sirable, if not essential, in the modern restricted field of the barber, in the opinion of Dr. Arnold H. Kegel, Commissioner of Health of Chicago, author of this article. He tells us that upward of 50 ordinances for the control of barber shops and similar personal service establishments have been passed by the leading municipalities of the United States during the past decade.

General cleanliness of shops and attendants, washing of hands before serving each customer, prohibition of the use of common towels and other common articles, sterilization of utensils after each use, prohibition of practice by or on diseased persons, licensing of operators, and posting of the rules, are some of the important provisions of ordinances or regulations concerned with barber shops.

These are good principles, but how ardently are they enforced? Anyone who uses a barber shop knows the answer. In Chicago each shop was inspected once a year and many violations were found. As Dr. Kegel says, however, the progressive barber realizes that compliance with such laws is to his advantage and will increase his trade.

Recent Court Decisions on Health—In Alabama a municipality installed a sanitary toilet on private property where the owner had failed to obey an ordinance requiring such installation. Although the city failed to comply with the statutory requirements for getting a lien on the property, the State Supreme Court held the owner liable for the expense on a contract action. *Town of Leeds v. Cason*, 116 So. 519.

In Illinois it has been held that a registrar of vital statistics cannot refuse to accept and file a valid birth certificate, because the registrar's duties are purely ministerial. *People v. Heckard*, 244 Ill. App. 112.

Lapse of time does not establish a right to maintain a public nuisance, in

this case the pollution of a water course, according to a Texas decision. *City of Corsicana v. King*, 3 S. W. (2d) 857.

An employe injured by an occupational disease, in this instance benzol poisoning, cannot recover under the workmen's compensation act of the State of Washington. *Seattle Can Co. v. Dept. of Labor and Industries*, 265 Pac. 739. In Minnesota, on the other hand, chemical poisoning of a physician's assistant while eating his lunch near the office in order to be able to answer telephone calls was an injury under the workmen's compensation act of that state. *Krause v. Swartwood*, 218 N. W. 555.

A city garbage ordinance has been upheld in California. *Ex parte Santos*, 264 Pac. 281.

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Miscellaneous Items—Standards for clinical thermometers have been fixed by the Commercial Standards Unit of the U. S. Bureau of Standards and will become effective on October 1, 1928.

Cartons for packing butter are favored by health officials, according to the U. S. Department of Agriculture, which has recently conducted a survey of this subject in 117 cities.

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BOOKS AND REPORTS

Health Essentials—By *J. Mace Andrews, Ph.D., A. K. Aldinger, M.D., and I. H. Goldberger, M.D.* Boston: Ginn, 1928. 481 pp. Price, \$1.72.

The authors consider the high schools as potent agencies in shaping public opinion and determining the progress of the nation. They hold that only a small percentage of high school students will go on to institutions of higher learning, while the large majority will end their formal education either before or at the time of graduation. The book is, therefore, designed especially for this class of students. Personal hygiene is placed first, with home hygiene as the second objective, and community hygiene the third; and since those in the high schools are facing the problem of choosing their life work, industrial hygiene is given due consideration, especially in regard to the health advantages or hazards involved.

The titles of the chapters have been selected with the object of being attractive. Health is held out as the foundation upon which success and happiness depend and not merely as an object in itself. Emphasis is laid on the prevention of disease and the building up of a virile personality. Introspection is to be avoided.

These ideas, taken largely from the preface, have in our judgment been successfully carried out. The text is enlivened by the life stories of prominent people, some of whom have succeeded in converting a childhood marked by ill health into an adult life of abounding vigor. Every chapter ends with questions for informal discussion in class and at home.

We have failed to find any topic undiscussed which boys and girls of the

age indicated should understand, and the information given is not only sound but clearly put. The illustrations are plentiful, good, and up-to-date.

Only a few points calling for criticism have come to our attention. The vitamin table, page 136, dates back to 1921, though much more recent tables are available. On page 139, under the heading "Food Poisoning," botulism only is considered. The discussion of infected foods in Chapter XX, to which we are referred for further information, is incomplete, and contains some statements which are erroneous, as for example, that Walter Reed discovered the "cause" of yellow fever, and Pasteur "a treatment for rabies." This latter mistake is already too common and should not be taught in schools. Harvey published his discovery of the circulation of the blood in 1619, and it is described in his notes dated 1615.

On the whole the book is well written and its make-up excellent. It can be safely recommended as a text for the class of students for whom it is designed.

M. P. RAVENEL

Industrial Nursing—(*Reissue*) By *Florence Swift Wright, R.N.* New York: Macmillan, 1928. 179 pp. Price, \$1.50.

To the nurse in an industrial position we recommend this reprint of Florence S. Wright's book because of the completeness of her understanding of the worker, the managing personnel and the employer; also because her views are applicable today—after ten years—and probably will be equally so for the next decade.

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We would highly recommend the book to anyone interested in the subject, both for private information and also as a basis for material for popular lectures.

WALLACE CRAWFORD

La Vaccination Préventive Contre la Tuberculose par le "BCG"—

By A. Calmette, Sous-Directeur de l'Institut Pasteur, Avec la Collaboration de C. Guérin, A. Boquet et L. Nègre. Paris: Masson et cie, 1927. 233 pp. Price, 22 Fr.

All bacteriologists, and especially those interested in immunization against tuberculosis, have followed carefully the work of Calmette and his associates, which began in 1903. The publications have appeared in various journals, though chiefly in the *Annales de l'Institut Pasteur*. It is a matter of great convenience to have all of this material now collected into one volume.

The book is divided into four parts, the first of which gives a good review of the attempts at vaccination from the time of the discovery of the tubercle bacillus. It is a matter of congratulation that American work is clearly recognized, and that Trudeau is given credit for his pioneer contributions.

The second part is devoted to the experimental studies on animals with the Calmette-Guérin vaccine, now universally known as "BCG." This section includes also the experiments of Wilbert on the vaccination of apes in the tropics.

The third part gives the history of BCG, its modification by growth on bile, begun in 1906, and its present preparation for use. The synthetic medium of Sauton is described. Biochemical, physiological, and histological studies are also included, the latter illus-

trated by plates made from microphotographs.

The fourth part is in some ways the most interesting, as it treats of vaccination of infants since 1921, and the results obtained. At the end of this section the forms used in connection with the statistical studies are reproduced.

The whole constitutes the record of a monumental piece of work, which has occupied a quarter of a century, and which has commanded the respect and attention of all scientific men. While the results obtained by the author and his coworkers have not been duplicated in other countries, and some criticism has been made of his controls, his work must always stand foremost in this line of endeavor. Concerning, as it does, the control of one of the chief scourges of mankind, the book should be read by physicians as well as bacteriologists.

The printing is excellent, and needless to say, it is written in the clear style characteristic of its senior author.

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mislead the uninformed. He says for example: "Sugar is undermining the nation's health." He condemns the great popularity of spinach, largely on account of the oxalic acid it contains, but partly for its high residue, and would add a Twentieth Amendment to the Federal Constitution prohibiting its use. On the next page he praises "lettuce as the greatest vegetable food given to humanity," though it is mentioned in several other places as being a high residue food. He makes no distinction between the colored lettuce and the bleached in regard to vitamin content.

On the whole, the book can be commended to laymen who do not care to go deeply into the subject. The printing and makeup are excellent and only a few mistakes have been detected. On page 12, the name of Dr. Graham Lusk is misspelled. Many chapters end with useful and appropriate axioms.

M. P. RAVENEL

Michigan Handbook of Hospital Law—By Dorothy Ketcham. Dearborn: Michigan Hospital Association, 1928. 237 pp. Price, \$2.00.

Physicians, sanitarians, and hospital executives in Michigan ought to find this little handbook indispensable. It should also serve as a guidebook for the preparation of similar reference books in other states.

This handbook summarizes the legal requirements affecting hospitals in Michigan. It has a convenient alphabetical arrangement of subjects, with numerous annotations to legislation, court decisions, and works of reference. The appendices contain a directory of hospitals and sanatoriums in the state, a list of agencies interested in hospitals, the state medical practice act, a bibliography (which is none too modern in some respects), a table of cases and much other useful information. There is a good index, and the book is well printed.

The idea is excellent and it is, in gen-

eral, well executed. This handbook is worth emulation elsewhere.

JAMES A. TOBEY

Personal Hygiene Applied (3d ed.)—By Jesse Feiring Williams, M.D., Teachers College, Columbia University. Philadelphia: Saunders, 1928. 458 pp. \$2.00 net.

This new edition of a well-known book is welcome. The first edition appeared 6 years ago. A book which has gone through 3 editions with 12 printings has made its place. The new edition brings the material up to date, with an increase of about 40 pages. A number of new illustrations have been inserted.

Not only the text, but the makeup of the book is up to the standard which was set by former editions. The reviewer continues to believe that it is the best book in its field.

M. P. RAVENEL

Group Clinics. A Study of Organized Medical Practice—By Walter C. Klotz, M.D. New York. 1927. 32 pp.

Health Services in Clinics—By Anna Mann Richardson, M.D. New York. 1927. 83 pp.

These two pamphlets are published by the Committee on Dispensary Development of the United Hospital Fund of New York.

Dr. Klotz takes up the origin of group clinics, and analyzes a few clinics as to their development and organization, physical construction and equipment, routine, services rendered, scope of practice, financial regulation and affiliations with hospitals and social service agencies.

In Dr. Richardson's pamphlet a brief résumé of the services rendered to children and adults at the several New York City health centers is given. This pamphlet can be of invaluable aid to the medical director and social service worker interested in obtaining information about practical procedure in successful health centers.

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

New Jersey—Bound in cloth covers, printed in good readable type, and containing both a table of contents at the front and an index at the back, this 50th annual report of 277 pages for the year ending June 30, 1927, records several advances in public health work. A state-wide movement to increase diphtheria immunizations was undertaken; a method for direct microscopic examination of milk for practical field use was developed; the continuous child hygiene program under state supervision was adopted by several new communities; the venereal disease control program was extended; and a successful school for employed health workers was conducted jointly by the state university and the Department of Health.

The outstanding accomplishment pertaining to milk control was the enactment of Chapter 233 of the laws of 1927 providing that no person shall purchase, distribute or sell for human consumption, any milk or cream which has not been pasteurized, excepting that produced by cows which have successfully passed a tuberculin test given the year of the sale of such milk or cream.

The child hygiene demonstrations are carried on by nurses in the various communities, usually for one year. At the end of the period, the community is asked to take over the salary of the nurse. There are 90 nurses under state supervision, 73 of whom are paid by the municipalities, 9 by the state, and the remainder out of state and municipal funds. The examination of preschool children to detect remedial defects before the child enters school has been emphasized in the baby-keep-well stations.

Work has been conducted in continuation schools in 3 districts. The girls are taught the principles of child hygiene

and health prevention and the nurses have been able to secure corrections of defects discovered among the girls themselves following physical examinations. During the year, the teaching of preventive measures to the student teachers in the normal schools has been extended so that all 5 schools are now covered.

The estimated population for 1926 was 3,570,159. A birth rate of 20.27, a death rate of 12.4, and an infant mortality rate of 70.3 (122.1 for colored) are recorded. Important statistical data are tabulated for long periods beginning with 1879, and several good charts add interest to the report.

Otero County, Colo.—A mimeographed report for 1927 shows that this county of 26,513 persons, 6,711 of whom were school children, had the benefit of full-time health service at a reasonable cost. There are 6 incorporated towns in the irrigated district, comprising 79,615 acres, the remaining area being utilized as dry farming and grazing land. During the year there were 570 births and 355 deaths, the chief causes of death being heart disease (57), pneumonia (38), gastroenteritis (32), premature births (31), cancer (28), and tuberculosis (25). During 1926 and 1927, 2,847 complete toxin-antitoxin immunizations were given, and it is noteworthy that last year there were only 2 diphtheria cases and 1 death reported. During the 2-year period, 1,791 smallpox vaccinations and 780 typhoid vaccinations were performed.

Macon City and Bibb County, Ga.—The 1927 report of the joint city and county board of health is well printed, contains a classified financial statement showing an expenditure of \$42,000 for

a population of 82,299 (37,188 colored), several good charts and statistical tables. Of unusual interest is the progress in sewer extensions reported. Following 37 deaths from diarrhea and enteritis, the attention of the mayor and council was directed to several congested districts affected. These were surveyed, with the result that increased appropriations were made to place sewer connections within reach of several hundred houses, the remaining districts being provided with sanitary pit privies (1,339).

Typhoid fever cases numbered 28 in 1927 as compared with 104 the previous year. Infant mortality dropped from 119.1 to 89.4, while the general death rate decreased from 16.6 per 1,000 population to 13.4. The Health Officer's report concludes with recommendations for further extension of health services along modern lines.

Rockford, Ill.—Special features of this 1927 report include an organization chart showing essential health activities, a unique chart showing office arrangements in the department, a financial statement, good statistical graphs and tables. "The extensive use of charts, maps, and diagrams has continued to be of especial value also as executed by each bureau, and has assisted in bringing the message of health to the public at times of conventions, exhibits, and addresses before clubs and parent-teacher associations."

It is noteworthy that 98.5 per cent of the milk supply in this city of 81,800 population, is pasteurized. Over 76 per cent of the births in 1927 occurred in 3 local hospitals. An infant mortality rate of 62.35 (50.96 resident), a general death rate of 9.97 (8.59 corrected for residence), and a resident birth rate of 16.66 are reported.

Pennsylvania Dairy and Milk Inspectors—Milk inspectors and health officers will find the 4th annual report

of the Pennsylvania Association (211 pages) of considerable interest. Formal addresses and committee reports cover a wide range of study and observation, including programs, legislation, education, laboratory and field investigations, and results. Increasing emphasis is being given to the importance of milk control in small communities, to the value of laboratory as well as field supervision, and to the importance of pasteurization, scientifically controlled. A few colleges have developed practical summer courses for training milk inspectors and laboratory workers.

Missouri Public Health Association—A mimeographed copy of the proceedings of the 3rd annual meeting of this state association held in coöperation with the State Board of Health and the International Health Board, contains the instructive papers presented at the 4-day session. The topics include epidemiology, laboratory procedures, tuberculosis and venereal disease control, rabies, mental hygiene, nursing, record keeping, publicity, child hygiene, public safety, sanitation, and community organization. . .

Cuyahoga Falls, O.—This city of 14,400 population covers an area of 9 square miles and has 72.48 miles of sanitary sewers and 74.35 miles of water mains. The school enrollment totals 3,421. A birth rate of 16.6, a death rate of 8.7, a tuberculosis death rate of 34.7 (per 100,000), and an infant mortality rate of 41.8 are recorded. The average age at death was 52 years in 1927. The report lists population and mortality figures of interest for 17 Ohio cities of similar population to that of this city. There were 9,701 nursing visits made during the year, of which 1,547 were to school children and 823 to tuberculosis patients. Scarlet fever was the outstanding disease of the year, with 104 cases and 1 death. Weekly laboratory anal-

yses are made of the milk and water supplies, the average bacteria count of the milk for the year being 20,400.

Kenmore, O.—Kenmore covers approximately 5 square miles and has a population of 20,467, with a school enrollment of 4,161. A birth rate of 18.1, a death rate of 4.6, a tuberculosis rate of 30.9 (per 100,000), and an infant mortality rate of 48.6 are recorded. There were no deaths from diphtheria, measles or scarlet fever, and but 1 death (30 cases), from whooping cough during the year. Nursing visits totaled 12,531—2,187 being to school children, and 1,998 to tuberculosis patients. "The physicians have materially assisted the Department of Health in the control of communicable diseases, and the board of health wishes to extend to the physicians of Kenmore their appreciation for this coöperation, as well as their prompt and complete reporting of the communicable diseases."

Mount McGregor Sanatorium—During the year 1927, 467 patients were admitted to this sanatorium of the Metropolitan Life Insurance Company, from the United States and Canada, and 430 were discharged. Of those admitted, 200 were tuberculous. A classification of types of cases admitted shows that 6.5

per cent were suspects, 38.5 per cent in the incipient stage, 34 per cent moderately advanced, 19.5 per cent far advanced, and 1.5 per cent non-pulmonary. The results of treatment in the discharged cases for the year show that 15 per cent were arrested, 68 per cent quiescent and improved, 10 per cent unimproved, and 7 per cent dead. The report contains other statistical data of considerable interest from the standpoint of diagnosis and treatment.

Pontiac, Mich.—The 4th annual report of the manager of Pontiac shows that approximately 10.5 square miles of area were annexed to the city in 1927, more than doubling the area and increasing the population by 4,655. The Public Health Department report shows a general death rate of 9.6, a birth rate of 24.5, and an infant mortality rate of 62.6. Of the total births, 32.4 per cent occurred in hospitals.

During the year, 4,672 toxin-antitoxin treatments and 1,176 Schick tests were given by the medical division of the public schools and the health department. Nursing visits to prenatal cases numbered 484, to infants 3,220, to pre-school children 7,649, and inspections of baby boarding houses 66, in addition to other work. Of the total milk supply, 95 per cent is pasteurized.

BOOKS RECEIVED

CHILD BIRTH. An Outline of Its Essential Features and the Art of Its Management. By Wm. G. Lee. Chicago: University of Chicago Press, 1928. 300 pp. Price, \$3.00.

PHYSIOLOGY AND BIOCHEMISTRY OF BACTERIA. Vol. I. By R. E. Buchanan, Ph. D. and Ellis I. Fulmer, Ph. D. Baltimore: Williams and Wilkins, 1928. 516 pp. Price, \$7.50.

PUBLICITY FOR SOCIAL WORK. By Mary Swain Routzahn and Evart G. Routzahn. New York: Russell Sage Foundation, 1928. 392 pp. Price, \$3.00.

THE PROBLEM OF INDIAN ADMINISTRATION. Report of survey made at request of Hon. Hubert Work, Secretary of the Interior, Washington: Institute for Government Research, 1928. 872 pp. \$5.00.

NURSES, PATIENTS AND POCKETBOOKS. Report of a Study of the Economics of Nursing Conducted by the Committee on the Grading of Nursing Schools. By May Ayres Burgess, Director. New York: Committee on the Grading of Nursing Schools, 1928. 618 pp. Price, \$2.00.

NUTRITION. Walter H. Eddy. Baltimore: Williams & Wilkins, 1928. 237 pp. Price \$2.50.

PERSONAL HYGIENE APPLIED (3rd ed. reset). Jesse Feiring Williams. Philadelphia: Saunders. 1928. 458 pp. Price, \$2.00.

EAT, DRINK AND BE HEALTHY. An Outline of Rational Dietetics. By Clarence W. Lieb. New York: John Day, 1928. 180 pp. Price, \$1.50.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Light Therapy in Clinics—British health authorities are urged to include artificial sunlight therapy in child hygiene clinics for rickets, skin diseases, and non-pulmonary tuberculosis.

BANKS, H. S. Artificial Sunlight Treatment in Public Health Work. *Pub. Health*, 41:9 (June), 1928.

Cancer Control—The author objects to "cancer week as in America" and suggests instead a sustained educational program. Being British, he does not know that doing things by weeks is our besetting national vice.

BELL, W. B. The Prevention of Cancer. *J. State Med.*, 36:6 (June), 1928.

Dental Caries in Childhood—The importance of mineral salts in preventing dental caries in children is indicated by the recorded experience with diabetic children in which a diet rich in salts arrested the caries. An important contribution for hygienists.

BOYD, J. D., and DRAIN, C. L. The Arrest of Dental Caries in Childhood. *J. A. M. A.*, 23:23 (June 9), 1928.

College Student Hygiene—Self supporting students made more frequent dispensary visits and spent more time in the infirmary than did independent students at Oberlin University.

BRADSHAW, R. W. Health of the Self Supporting College Student. *J. A. M. A.*, 90:22 (June 2), 1928.

The Science of Epidemiology—This paper is a discussion of the history and practice of epidemiology addressed to the educated laity. Very well done; useful as an example for others who write.

CHAPIN, C. V. The Science of Epidemic Diseases. *Scient. Monthly* (June), 1928.

Electrophoresis of Diphtheria Bacilli—This is a series of papers discussing and describing the method of determining virulence by electrical reactions. The authors report the method to be simple and, in general, to give reliable results as checked against guinea pigs.

FALK, I. S., et al. Electrophoresis of Diphtheria Bacilli. *J. Bact.*, 15:6 (June), 1928.

Sex Education—The moral, social, and biologic aspects of sex are dealt with fearlessly in this stimulating paper. The author concludes that we could be rid of the venereal diseases in a single generation by utilizing fully all the means of education at our command.

HILL, T. W. Sex Education as a Public Health Problem. *Med. Off.*, 39:20 (May 19), 1928.

Rheumatism Control—A hopeful summary of the problem, emphasizing the importance of personal hygiene and environmental conditions in childhood.

NEWMAN, G. The Control of Rheumatism. *Med. Off.*, 39:20 (May 19), 1928.

Antirachitic Factor in Human Milk—Human milk contains no antirachitic factor for rats, whereas cow's milk does possess rickets-healing substance. This phenomenon is not due to a higher percentage of calcium and phosphorus in the latter.

OUTHOUSE, J., et al. Human Milk Studies. *J. Biol. Chem.*, 78:1 (June), 1928.

Rabies Prophylaxis—An article emphasizing the importance of cauterizing dog bites with fuming nitric acid and the advantages of the Semple prophylactic injections.

ROSENAU, M. J. Rabies. *Northeast J. Med.*, 198:15 (May 31), 1928.

Diphtheria Immunization Procedures—Directions for using the Schick test outfits and toxin-antitoxin mixture supplied by the Massachusetts health department.

SCAMMAN, C. L. Active Immunization against Diphtheria. *Northeast J. Med.*, 198:16 (June 7), 1928.

Brucella Abortus Infections—This paper is a report of seven cases of *B. abortus* infection in man and describes the widely varied clinical symptoms observed. It confirms earlier reports of such infections.

SENSENBICK, R. L., and GIORDANO, A. S. Brucella Abortus Infection in Man. *J. A. M. A.*, 90:22 (June 2), 1928.

Etiology of Rheumatic Fever—The author offers *streptococcus cardio-arthritis*, a new species with distinguishing cultural and serologic characteristics, as the cause of the condition. Antisera are found to have therapeutic value, and the antigen prepared from the organisms stimulates active immunity.

SMALL, J. C. Rheumatic Fever. *Am. J. Med. Sci.*, 175:5 (May), 1928.

Spray Painting Hazards—This summary of two studies of spray painting emphasizes the danger of benzol poisoning when this solvent is used; the use of benzol substitutes; the periodic examination of sprayers. The lead and silicosis hazards in spraying vitreous enamels is also covered.

SMYTH, H. F., and SMYTH, H. F., Jr. Spray Painting Hazards as Determined by the Pennsylvania and the National Safety Council Surveys. *J. Indust. Hyg.*, 10:6 (June), 1928.

Serum Sensitization—Serum reactions occurred almost as frequently among persons who had previously never received horse serum as among those who had. In a small series of cases it was found that toxin-antitoxin did not sensitize the patient. That such sensitization occurs is doubted by the author.

SPICER, S. The Effect of Previous Administration of Antitoxin and Toxin-Antitoxin on Serum Reaction. *J. A. M. A.*, 90:22 (June 2), 1928.

Educational Standards for Sanitarians—In a few of the closing paragraphs of his inaugural address, the president of the A. M. A. appeals for an adequately trained public health personnel.

THAYER, W. S. Inaugural Address as President of the A. M. A., *J. A. M. A.*, 90:24 (June 16), 1928.

Bathing Beach Pollution—A bacteriologic study of the waters at public bathing beaches about New Haven Harbor showed that the water was so polluted with New Haven sewage that the beaches were unfit for bathing. Similar studies might well be made of similar conditions near other large cities.

WINSLOW, C.-E. A., and MOXON, D. Bacterial Pollution of Bathing Beach Waters in New Haven Harbor. *Am. J. Hyg.*, 8:3 (May), 1928.

NEWS FROM THE FIELD

DR. FORGE FULL-TIME COUNTY HEALTH OFFICER

DR. F. W. Forge has been appointed full-time Health Officer of Charves County, N. M. Pending the appointment of Dr. Forge, the health work in the county was directed by Dr. W. W. Phillips who was carrying on this public work along with his private practice, but found it an overburdening task to do both pieces of work.

HERMAN N. BIGGS MEMORIAL FUND

THE Herman N. Biggs Memorial Fund recently gave \$55,000 to New York University and Bellevue Medical College to establish a Herman N. Biggs professorship in preventive medicine.

OHIO PUBLIC HEALTH ASSOCIATION HEALTH COURSE

DR. R. G. Paterson, executive secretary of the Ohio Public Health Association will conduct a course in public health in connection with the Ohio Welfare Conference in Columbus, O., October 8-10, headquarters at the Deshler-Wallick Hotel.

Ten study courses are to be given at the conference, and each course will consist of 5 sessions. Assisting Dr. Paterson will be C. L. Brownell of Ohio State Department of Education; Howard W. Green, Cleveland Health Council; and Bleeker Marquette, Cincinnati Public Health Federation.

OHIO TUBERCULOSIS SOCIETY CHANGES NAME

THE Ohio Society for the Prevention and Cure of Tuberculosis has changed its name to the Ohio Public Health Association and will extend its activities to include other phases of public health work. Committees are to be established to deal with tuberculosis,

public health nursing, hospitals, clinics, social hygiene, better milk, child hygiene, heart disease, industrial hygiene, cancer, mental hygiene, mouth hygiene, and periodic physical examinations. The 27th Annual Meeting of the Ohio Public Health Association was held recently when the plan of reorganization was submitted by Dr. Robert H. Bishop, Jr., president.

DR.P.H. FROM FOREIGN COUNTRIES

RECIPIENTS of the degree of doctor of public health and the certificate in public health given by Johns Hopkins University at its 1928 commencement included candidates from Spain, Turkey, Jamaica, Hungary, Japan, China, Columbia, India, Czechoslovakia, Bulgaria, Jugo-Slavia, Mexico, Chili, Germany and Honduras.

An anonymous gift of \$1,000,000 was made to the university and a gift of \$500,000 was made to complete the endowment of the William H. Welch Medical Library. A gift of \$100,000 was also made to the Wilmer Eye Clinic.

HOLLAND INSTITUTE OF THERMOLOGY

TO teach the American home-owners in a practical way the science of heating and ventilating their homes in relation to health, the Holland Institute of Thermology has been established. The institute has been created by A. H. Landwehr, president of the Holland Furnace Company of Holland, Mich. It is the hope of the promoter of the institute to make a contribution to health conditions by perfecting ventilation in the home. A research engineer will direct the tests and investigations which will be made public from time to time.

The investigations will attempt to determine how many diseases result from the improper or inadequate humidify-

ing of homes; how the seasonal occurrence of certain respiratory diseases can be modified or reduced by control of the humidity, temperature and circulation of the air in dwellings; the national economic loss due to soot and the methods available to prevent it. There will be fuel studies as related to the national fuel reserves; a medical analysis of conditioning the air so that atmosphere in the home will contribute to the health, efficiency and comfort of the family; a test for the number of air changes required in each room every hour to keep the atmosphere healthy and free from noxious germs; studies of methods of sterilizing air to minimize the circulation of disease-ridden air homes, and to ascertain the heating costs of the average home-owner.

JOHNS HOPKINS COURSE FOR PUBLIC HEALTH OFFICERS

A COURSE for the additional training of physicians who are engaged or who plan to become engaged in public health work will be given at Johns Hopkins University during the spring trimester, March 11-June 1, 1929. The course will be offered if not less than 10 students register for it by February 11, 1929. Candidates eligible to take the course must be graduates in medicine or have had other special training specified in the requirements. At the conclusion of the course a certificate of attendance will be awarded.

MATERNITY WELFARE IN LATIN AMERICA

AMONG the resolutions passed by the committee on social problems and hygiene of the Sixth International American Conference held in Habana from January 16 to February 22, 1928, was one recommending that every American country should have a corps of visiting public health nurses.

Another resolution recommended the enactment of laws providing for compulsory vacations for expectant mothers,

whether in public or in private service, for 40 days before and 40 days after confinement, with the payment of full salary.

THE CAIRO CONGRESS

ANNOUNCEMENT has been made of The Centenary celebration of the Faculty of Medicine, Cairo, and the International Congress of Tropical Medicine and Hygiene, to be held under the patronage of His Majesty, King Fonad I, December 15 to 22, 1928. The work of the Congress will be carried out by the following sections: tropical medicine, surgery, ophthalmology, hygiene and sanitation, parasitology, and pathology and bacteriology.

CALIFORNIA MAKES TWO ADDITIONAL DISEASES REPORTABLE

TULAREMIA and coccidioidal granuloma have been made reportable diseases by the California State Board of Public Health, according to a recent announcement from Walter M. Dickie, M.D., Director.

Health officers have been requested to notify physicians in their respective territories under their jurisdiction in order that cases of these diseases will be reported promptly.

MICHIGAN MAKING BREAST FEEDING SURVEYS

BREAST feeding surveys are being made in five counties in Michigan, including Menominee, Houghton, Arenac, Montcalm and Crawford.

MATERNAL MORTALITY DECREASE IN RURAL NEW YORK

IN rural New York there was a decrease of 26 per cent in the maternal mortality rate for the period 1921-1925 from the rate for 1915-1920. This decrease is considered as possibly due to the increased use of hospitals for confinement purposes by rural mothers.

FINDINGS IN COST OF MEDICAL CARE

THE demand for medical services, their supply and distribution are subjects of a preliminary survey being made by the Committee on the Cost of Medical Care, which has its 5-year program well under way.

According to an announcement recently made by the chairman of the committee there are now 1,000,000 persons engaged on a whole-time basis in curing and preventing diseases. Although \$5,000,000,000 are invested in hospitals and other equipment, many people of the United States are not receiving adequate medical service at costs within their means. It is found that the high costs are due often to the many separate bills, not only the physicians' fees. Too, physicians as a group are not earning adequate incomes considering the cost of their years of training and their overhead expenses, and many do not have access to hospitals and other facilities for scientific work. It has also been found that nurses and dentists are not receiving satisfactory returns for their services. It is the purpose of the committee to investigate the fundamental causes of the existing situations, and to make recommendations for the remedies.

In addition to the cost to the people of hospital care, nursing, dentistry, drugs, physiotherapy, surgery, and other medical services, the committee will follow the preliminary survey with a study of the problems involved in the prevention and cure of disease.

Another group of studies will be an analysis of industrial medical services and other organized facilities now serving particular groups of the population.

It has been estimated that illness costs

the people of the United States more than \$5,000,000,000 a year.

The committee's program is being supported by the Carnegie Corporation, Milbank Memorial Fund, Russell Sage Foundation and the Twentieth Century Fund. The American Medical Association, the U. S. Public Health Service and the Metropolitan Life Insurance Company will cooperate with the committee.

Officers of the committee organized in May, 1927, are: Ray Lyman Wilbur, M.D., President Stanford University, Chairman; C.-E. A. Winslow, Dr.P.H., School of Medicine Yale University, Vice-chairman; Chellis A. Austin, Seaboard National Bank, Treasurer; and Harry H. Moore, director of study.

HEALTH OFFICERS TO MEET IN OCTOBER

THE annual meeting of California health officers will be held, as usual, in conjunction with the convention of the League of California Municipalities in San Bernardino October 9 to 13, 1928. Preparations for the program are now under way and the 1928 meeting gives promise of being the most successful ever held.

UNIVERSITY OF TORONTO'S M.D. DEGREE

THE proposal, sponsored for some time past by Dr. Herbert Bruce, has finally been accepted by the Board of Governors of the University of Toronto with the announcement on June 1 that the university has fallen into line with many other universities in different parts of the world and has decided to grant the degree of Doctor of Medicine to all students qualifying in the 6th year course. This will take the place of the degree of Bachelor of Medicine, which was the only award up till the present.

PERSONALS

W. S. BIZZELL, for several years sanitary engineer with the Fort Worth, Tex., City Health Department, has been appointed supervisor of public utilities for the City of Coleman, Tex.

DR. T. A. CALLAHAN has been appointed full-time County Health Officer for Hartford County, Md.

DR. PORTER J. CRAWFORD, formerly secretary of the Miami, O., County Public Health League and Health Commissioner of Troy and Miami Counties, O., sailed for Brazil, July 1, as a member of the Rockefeller Foundation. He will assist the Brazilian Government in the establishment of local health units in Northern Brazil and in the program of prevention of yellow fever.

DR. EDGAR R. HIATT has resigned as health commissioner of the City of Logan and Hocking County, O., to become health commissioner of the city of Troy and Miami County. He succeeds Dr. Porter J. Crawford.

DR. F. D'HERELLE of Paris has been appointed professor of bacteriology in the School of Medicine, Yale University. Dr. d'Herelle is best known for his development of the subject of bacteriophagy, although he has made other contributions to the subject of bacteriology. Dr. d'Herelle is a native of Montreal, Can., and has had extensive experience in foreign fields.

DR. E. MURPHY HOWARD, JR., Harlan, Ky., and Dr. Lawrence T. Minish, Frankfort, Ky., have been appointed to the Kentucky State Board of Health for a period of 4 years by Governor Sampson. They will succeed Dr. Joseph E. Wells of Cynthiana and Dr. James W. Kincaid of Catlettsburg.

DR. S. ROWLAND HILL has been reap-

pointed City Health Officer of Lansing, Mich.

GRACE LUBIN, PH.D., has been appointed director of the serologic work of the laboratories of the Michigan State Board of Health at Lansing. Dr. Lubin succeeds Reuben L. Kan, Sc.D., who goes to Ann Arbor as director of the laboratory of the University Hospital.

DR. JOHN S. FULTON, who has been with the Maryland State Health Department since 1896 has resigned as director and has been appointed director emeritus. Dr. Robert H. Riley, assistant director, has been appointed to succeed Dr. Fulton.

DR. WILLIAM C. CAMP of Spencer, W. Va., has been appointed Health Officer of Roane County.

OLLIE E. READ, head of the dairy husbandry division, Michigan State College of Agriculture, East Lansing, Mich., has been appointed chief of the Bureau of Dairy Industry, U. S. Department of Agriculture.

DR. RAFFAELE LORINI, health officer of Coronado, Calif., for 27 years, has resigned. Dr. Charles W. Lane is acting City Health Officer of Coronado, pending the reorganization of the city Board of Health.

DR. A. GRANT FLEMING has been appointed Director of the Department of Public Health and Preventive Medicine at McGill University, Montreal, Can.

DR. CHANNING E. DAKIN has been appointed Health Commissioner of Mason City, Ia. to succeed the late Dr. Matthew J. Fitzpatrick.

DR. ROBERT SEBASTIAN COWLES of Franklin, Tenn. has been appointed Health Officer of Greene County, Tenn.

SWIMMING POOLS AND OTHER PUBLIC BATHING PLACES

Standards for Design, Construction, Equipment and Operation in an 18 page reprint, corrected and revised to February, 1928. Price \$.25.

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American Journal of Public Health

and THE NATION'S HEALTH VOL. X NO. 9

VOLUME XVIII

September, 1928

Number 9

A Sickness Survey of Winchester, Mass.

Part I: General Mortality

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IN THE spring of 1927, the Massachusetts Department of Public Health conducted a morbidity study in the town of Winchester, Mass. This town, one of a group of cities and towns which comprise Metropolitan Boston, is about eight miles north of downtown Boston. Winchester is largely residential, although there are a few manufacturing, industries, and small stores. The estimated population of the town in November, 1926, was 11,890. It has a 55-bed hospital, and a very active Visiting Nurse Association. The schools of Winchester are among the best in the state, and for a number of years they have used the physical examination records which comply with the standards as set forth by the State Departments of Education and of Public Health. The Board of Health is a most progressive one, and is doing a very satisfactory piece of work. There are 28 physicians living in Winchester, 14 of whom practice in the town.

METHOD OF APPROACH

The surveyors made a house-to-house canvass of the town and obtained from each person interviewed the following information concerning every member of the family: the name, address, and position in the family, the country of birth, the age, sex, whether or not the individual was a wage earner, the present illness and illnesses during the past year, the type of treatment secured, and the amount of time lost from work. For all individuals under 20 years of age, additional information was sought relative to diphtheria, chicken pox, German measles, mumps, scarlet fever, measles, and whooping cough. A history

NOTE: The results of the Winchester studies will be published in the JOURNAL in three parts. The second part dealing with the contagious diseases, and the third with the relation of physical defects to school absenteeism, will appear in the October issue.

of any of these diseases necessitated questions concerning the type of treatment and the year in which the disease occurred. An estimate was made of the economic status of the family, classifying all families in one of four groups: poor, moderate, comfortable, or wealthy.

If no member of the family was at home, blanks were left requesting that the desired information be forwarded, as the time allotted to the survey did not permit return visits. During one week of the survey, the practicing physicians in Winchester reported to the department the number of sick individuals whom they attended. This information, together with the records of the Winchester Visiting Nurse Association, was compared with the data collected by the investigators to check on the reliability of the survey. The death records were tabulated similarly to the morbidity records. A study of nursing and hospital facilities was made by consulting the records of the Winchester Visiting Nurse Association and those of the Winchester Hospital, as well as by the questionnaire method. The contagious disease records of the Winchester Board of Health were obtained to ascertain the number of diseases that were reported and the number hospitalized. The data contained on the physical record forms used in the Winchester schools was studied in relation to school absenteeism.

GENERAL DISCUSSION OF RESULTS

Records were obtained from 9,746 individuals. This comprised 82 per cent of the estimated population of the town at the time the survey was made. A census of the surveyed population is shown in Table I.

Winchester has an older population than the state. The proportion of foreign born population is less than that of the state as a whole, although the proportion of Irish and Italian is higher in Winchester than in Massachusetts as a whole. The sex ratio of Winchester differs materially from that of the state proper, since Winchester has 80.8 males for every 100 females, while Massachusetts has 96.3 males for every 100 females.

It is impossible to state mathematically the degree of reliability of the Winchester sample. The surveyed individuals were well distributed throughout the town, and in all probability furnish a very fair sample of the whole town. The accuracy of the answers given to the investigators varies considerably with the different questions. In the contagious disease part of the study the householder was asked specifically whether or not the individual members of the family had had the given diseases. The answers to these questions were largely correct, although there was some confusion between measles and German measles. The follow-up question regarding whether or not a

TABLE I
POPULATION OF WINCHESTER
(82 per cent of town)

Age	United States		Ireland		Italy		Canada		Others		Total		Both	Per cent	Per cent
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Sexes	Survey	Census 1920
0-5	508	510	0	2	0	1	3	8	5	2	516	523	1039	10.7	12.0
6-15	850	892	1	2	11	6	4	0	12	0	878	918	1796	18.5	18.0
16-25	573	677	21	73	27	34	16	68	22	34	659	886	1545	15.9	16.2
26-35	428	595	17	56	40	40	23	60	36	57	553	817	1370	14.1	16.9
36-45	455	501	44	78	61	52	32	77	44	46	636	754	1390	14.3	14.0
46-55	361	431	58	79	36	29	34	62	38	51	527	652	1179	12.2	11.2
56-65	239	262	45	58	19	8	30	55	30	34	372	417	789	8.1	6.8
66-75	95	193	14	20	2	1	20	27	9	19	140	260	400	4.1	3.7
Over 75	29	91	3	8	0	0	10	13	5	5	47	117	164	1.7	1.2
Total	3540	4166	204	376	206	181	174	379	215	278	4353	5384	9746		
Total Both															
Sexes	7715		580		387		554		493		9746				
Percentage by nativity for survey	81.4		6.6		4.0		5.7		2.4						
Percentage by nativity for State 1920.	71.8		4.8		3.0		7.0		13.4						

NOTE: Totals include individuals for whom one or more items regarding age, sex and nationality are not complete.

doctor had seen the sick child was not so accurately answered, as many householders evidently confused the call of the Board of Health with that of the practicing physician.

In the morbidity study, the question whether the individual had had any illness in the past year was asked, and the answer depended on what the person answering the question considered an illness. Some considered the slightest pain an illness, while others did not consider themselves sick unless they were confined to bed; consequently, the morbidity figures are more accurate in the more severe conditions than in the minor ailments. But, as the survey was primarily intended to ascertain the extent of real illnesses rather than to catalogue the many aches and pains which are present in the majority of individuals, it is felt that the main object has been attained, and that the Winchester Survey gives a representative picture of the extent of real illnesses, as well as some indication of the extent of minor ailments.

During the year preceding the survey, 3152 individuals were reported as sick. This comprised 32.4 per cent of the surveyed population of Winchester. About one-sixth of those sick had more than one illness during the year, as 2581 reported one illness, 465 reported two illnesses, 87 reported three illnesses, and 4 reported five illnesses.

The nomenclature of diseases is that which was furnished the investigators by the householder. No attempt was made by the surveyors to make these causes conform with those of the International Classification of Causes of Death. The morbidity nomenclature tells what the people, themselves, complained of as sickness. Of striking interest is the fact that only one-half of the mothers who bore children during the year considered normal childbirth an illness. Upon questioning, mothers would repeatedly say that childbirth was a normal function and that they were not sick. In the Italian district this was particularly marked, as only one-seventh of the childbirths were reported to the surveyors.

During the period covered by the survey, 149 residents of Win-

TABLE II
MORBIDITY IN WINCHESTER

Diseases	Mortality	Crude Mortality Rate per 1000	Morbidity in Survey	Crude Morbidity Rate per 1000 in Survey	Crude Morbidity Rate per 1000 in Winchester
Pneumonia	10	0.8	56	5.8	6.6
Tuberculosis	11	0.9	12	1.2	2.1
Other respiratory	1	0.1	1477	151.8	151.9
T. & A. Operation			83	8.5	8.5
Other Operations			45	4.6	4.6
Infectious Diseases	5	0.4	397	40.8	41.2
Cancer	21	1.8	13	1.3	3.1
Nephritis	4	0.3	38	3.9	4.2
Apoplexy	19	1.6	11	1.1	2.7
Heart	35	2.9	128	13.1	16.0
Stomach			182	18.7	18.7
Intestines	1	0.1	132	13.6	13.7
Rheumatism			202	20.8	20.8
Nervous condition (Including headache)	2	0.2	161	16.5	16.7
Female Genitals					
Childbirth			38	3.9	3.9
Tired Feeling			96	9.9	9.9
Accidents			35	3.6	3.6
Swelling	3	0.3	122	12.5	12.8
Pain			4	*	*
Loss of Weight			6	*	*
Diabetes			9	*	*
Convalescence	3	0.3	13	1.3	1.6
Chronic Invalidism			5	*	*
Adenitis			33	3.4	3.4
Mental			15	1.5	1.5
High Blood Pressure			13	1.3	1.3
Syphilis	11	0.9	53	5.4	6.3
Ill-defined			5	*	*
Other conditions	23	1.9	8	*	*
All causes	149	12.5	460	47.3	49.2
			3852	396.0	408.5

* No rates computed where the crude morbidity rate in Winchester would be less than 1.0.

** In the subsequent tables, morbidity is represented by data from the survey alone.

chester died. These cases represented morbidity during the year but were not included in the tabulation of the survey. In order to obtain the correct morbidity rate, the mortality rates have been added to the morbidity rates obtained from the survey in Tables II and III.**

The incidence of most of the diseases is too small to make adjusted rates for age and sex. The same applies to nativity adjustments. In Table III an attempt has been made to give some idea of the age and nativity distribution in all types of illness. This table shows that the Irish and the Italians have lower rates than the native born and the Canadians. While these differences for "total all ages" are statistically significant, it is believed that other errors than mere chance enter in, as we find that the total time lost from sickness for these respective groups is larger among the nativity groups that give the lower incidence. The error, doubtless, is due to the probability that the Irish and the Italians reported only the more severe illnesses, although it is admitted that there may be real differences.

TABLE III
MORBIDITY IN WINCHESTER: BY AGE AND NATIONALITY
(Rates per 1000)

Age	United States	Irish	Italian	Canadian	Others	Total		Total	Ratio Morbidity Rate Females to Males
						Male	Female		
Under 5	388	*	*	*	*	371	406	388	1.00
5-15	412	*	*	*	*	394	423	408	1.07
16-25	282	181	229	381	250	255	293	277	1.15
26-35	346	247	235	373	269	268	358	334	1.34
36-45	385	229	292	312	367	303	402	356	1.33
46-55	457	248	400	366	326	348	465	413	1.34
56-65	518	514	444	494	288	400	573	491	1.44
66-75	756	588	*	659	785	588	815	736	1.39
Over 75	1034	*	*	*	*	808	977	929	1.21
Male (All ages)	354	231	291	411	302	359			
Female "	452	343	304	422	348		446		1.24
Total "	407	303	297	418	335			407	

* No rates computed where the population of the age groups is very small.

In all the age groups the females have higher morbidity rates than the males. The ratios of the rates vary from 1.07 in the 16-25 year group, to 1.44 in the 56-65 year group, with the ratio for all ages of 1.24. A second ratio for all ages was computed, omitting childbirth and diseases of the female genitals. This ratio (1.20) shows that sickness is more common among women even under these conditions. This phenomenon is not confined to Winchester alone. Sydenstricker¹ shows in his morbidity study of Hagerstown that the ratio of sick females to males was 1.28; and omitting childbirth and diseases of the

female genitals the ratio was 1.16. The ratio of the death rates among females to that among males in Winchester for the past 23 years is 0.94. Females apparently have more sicknesses than males, but the death rate is less. The relation between sickness and time lost is shown in Table IV.

The total number of days lost from illness in Winchester was 12,904. Accidents accounted for 2898 days, respiratory diseases 2570 days, intestinal diseases 1244 days, stomach complaints 965 days, heart affections 923 days, and the remainder were distributed among various other conditions.

The types of illnesses were studied in relation to the economic status of the individuals. When all diseases are considered collectively, there are significant differences between the rates for the various economic groups, the poor having the lowest rate, and the comfortable and wealthy, the highest. Whether this depicts real differences or merely indicates that more minor complaints were reported by the well-to-do is difficult to ascertain. The only individual diseases where significant differences were found were in the respiratory group, accidents among males, and rheumatism and stomach complaints among females. In the respiratory group the reporting of colds for both sexes increased with better economic conditions. Accidents among males were more common in the moderate wage groups. This would be expected, as mechanics, electricians, and men exposed to hazardous occupations are largely in this group.

Stomach complaints and rheumatism are both significantly high in the comfortable and wealthy female groups, but this again may only indicate differences in reporting. The rates for the diseases with significant differences are given in Table V.

There are slightly significant differences in the per cent of cases that employed physicians in the different groups (Table VI).

There is no significant difference between the percentage of sick males and females who consulted physicians; the respective rates being 78.8 for the males and 77.8 for the females.

Of the total cases of sickness 78.4 per cent employed a physician. There are no significant differences between the various nativity groups in regard to the employment of physicians, but the Italians and Canadians show lower rates than the other groups. There is a possibility that if the native born children of these various nativity groups were included with their parents, these differences might be significant. The percentage of physicians employed varied considerably with the different complaints. Table VII shows this for the more common diseases.

TABLE IV

Country of Birth	TIME LOST: BY NATIVITY GROUPS			Average Time Lost (Days per year)		
	Wage Earners			Male	Female	Total
	Male	Female	Total			
United States	1245	517	1762	5.9	2.7	5.0
Ireland	147	117	264	8.7	2.5	6.0
Italy	124	10	134	9.5	3.7	9.1
Canada	93	89	182	7.1	1.8	4.5
Other Countries	122	61	183	3.5	1.2	2.7
Not Stated	6	9	15			
Total	1737	803	2540	6.3	2.5	5.1

TABLE V

	MORBIDITY RATES: BY ECONOMIC STATUS						Comfortable & Wealthy		
	Poor			Moderate			Male	Female	Total
	Male	Female	Total	Male	Female	Total			
Population	1152	1106	2258	1477	2026	3503	1643	2114	3757
Total Illnesses	243	324	567	487	830	1317	728	1146	1874
Rate per 1000	211	293	251	330	408	371	443	542	499
Respiratory Diseases	96	98	194	197	287	484	359	480	839
Rates per 1000	83	89	86	134	142	138	218	227	223
Accidents	12	4	16	39	24	63	14	27	41
Rates per 1000	10	4	7	26	12	18	9	13	11
Rheumatism	21	21	42	12	39	51	23	80	103
Rates per 1000	18	19	19	8	19	15	14	38	27
Stomach	8	14	22	19	34	53	39	65	104
Rates per 1000	7	13	10	13	17	15	24	31	28

TABLE VI

	PERCENTAGE OF PHYSICIANS EMPLOYED: BY ECONOMIC STATUS		
	Poor	Moderate	Comfortable & Wealthy
Male	75.3	77.9	80.6
Female	71.9	76.4	80.8
Total	73.6	76.7	80.7

TABLE VII

Disease	TYPE OF TREATMENT			
	Registered Practitioner	Rate per 100		Chiropractor
		Christian Science	Healer	
Other respiratory	67.2		0.4	
Infections	90.0		0	0.1
Heart	90.4		0	0
Stomach	72.0		0	0
Intestines	88.0		0	0
Rheumatism	73.4		0	0
Nervous	81.1		0	0
Accidents	94.8		0	0
All causes	78.4		0.5	0.1
				21.0

Six physicians reported attending 235 cases during the week of June 1 to 7, 1927. If the physicians who did not report their cases had seen a similar number of cases to those who furnished reports, there would have been 548 cases attended by physicians during that week. If this represents 78.4 per cent of all the cases, there would have been 699 people ill in Winchester at that time. Our surveyors found

705 illnesses at the time the call was made. This gives added weight to the conclusion that the data collected is fairly representative of the true conditions in the town.

An attempt was made to determine the hospital and nursing facilities in Winchester by studying the records of the Visiting Nurse Association, by ascertaining the number of admissions to the Winchester Hospital, and by questioning a sample group of the surveyed population. The results indicate that Winchester is meeting the present demand for hospital and nursing care.

In the last fiscal year, the Winchester Hospital admitted 365 patients who were residents of the town, comprising about 3 per cent of the population. The proximity of Boston leads to the belief that many other patients went to other hospitals. Of these admissions, 87, or 23.8 per cent of the total Winchester admissions, were for childbirths, comprising 44.3 per cent of the births in Winchester. An additional 19.1 per cent of the births were hospitalized in out-of-town hospitals, making 63.4 per cent of the births in Winchester hospital cases. The per cent hospitalized by nativity is shown in Table VIII.

TABLE VIII
HOSPITALIZATION FOR CHILDBIRTH: BY NATIVITY OF MOTHER
(Rate per 100)

United States	Ireland	Italy	Canada	Other	Total
78.7	75	14.9	88.8	71.4	63.4

Since the numbers are so small, the maternal death rate by nativity is not included, as unwarranted inference for or against the quality of hospital service might be drawn.

Twenty-seven cases of respiratory diseases were hospitalized in the Winchester Hospital. This represents 1.5 per cent of the number obtained in the survey, and 7.4 per cent of the total admissions of Winchester patients to the hospital. The average length of stay for patients who were discharged alive from the hospital was 7.9 days, for those who died 3.4 days. The average length of stay for respiratory cases was 10.7 days, and for confinement cases 14.0 days. A large number of tonsil and adenoid cases made the average length of stay short.

About 10 per cent of the families in Winchester employed visiting nurses. These nurses cared for 1 patient in 193 homes, 2 patients in 69 homes, 3 patients in 3 homes, and 4 patients in 1 home. In the sample group interviewed by the surveyors, it was found that district nurses, practical nurses, and private nurses were employed about equally. As the surveyors queried only 63 families who had employed nurses, it is impossible to state whether the population at large would have shown a like distribution.

The private duty nurse received a salary ranging from \$42 to \$49 a week, being employed from a few hours in some instances to 83 days, the median time being 2 weeks. The practical nurse received from \$15 to \$35 per week, being employed from 4 days to 3 years, the median being 5 weeks. Nurses were employed for a great variety of causes, the chief one being childbirth. Two nurses were hired merely to help with the housework. As a general rule, the nurses employed were satisfactory, and there was no complaint of difficulty in securing their services.

CONCLUSIONS

1. The population of Winchester is not exactly representative of Massachusetts as a whole, as Winchester has an older population, an excess of females and fewer foreign born.

2. The findings of the survey are felt to be fairly accurate for the more serious illnesses, and considerably less accurate for such minor ailments as a headache, slight cold, etc.

3. Thirty-two per cent of the group surveyed reported being ill during the year preceding, an average of 1.2 times.

4. The crude morbidity rate for all reported illnesses was 409 per 1,000, the largest single group being colds and grippe with a rate of 152.

5. The Italians do not consider childbirth an illness, and most of the confinements occur at their homes.

6. Females have a higher morbidity rate than males, but a lower mortality rate.

7. The average time lost by wage earners for illness was 5.1 days. The average time lost by males was two and one-half times that lost by females.

8. There are apparent differences among the different nativity groups but these may be due to unknown errors. The Italians and Irish have low morbidity rates but have greater average time lost than the other nationalities. The Italians and Canadians employ doctors to a less extent than the other groups, but the small numbers make this finding insignificant statistically.

9. The number of illnesses reported increased with the economic status of the individual for all diseases as a whole, as well as for respiratory diseases, for rheumatism, and for stomach trouble among the females. Accidents were greater among males in the moderate economic group.

10. The percentage of physicians employed increased with the economic status.

11. Nursing and hospital facilities are apparently adequate to the present demand in Winchester.

12. The findings of this study emphasize the advisability of conducting similar surveys in connection with larger populations in order to eliminate the errors of chance fluctuation.

NOTE: Acknowledgment is made of the valuable aid given by the surveyors: Anna Crivello, Mary Cronin, Mrs. Filip Forsbeck, and Dr. Florence Hopkins. Without their indefatigable and intelligent services, together with their enthusiastic coöperation, this survey would not have been possible. Recognition is made of the assistance rendered by Estella L. Power in the compilation of the various tables, and by Dr. Carl R. Doering in their analysis.

REFERENCE

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Problems in the Prevention and Relief of Heart Disease*

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THERE is definite information concerning certain phases of heart disease; but there is much evidence which is controversial; and, of more importance, there are many phases of heart disease about which little or nothing is known. Many of the problems concerned in the prevention and relief of heart disease fall into this third category. The problem of what causes heart disease may be taken as an example. It is obvious that heart disease cannot be prevented unless the etiology of heart disease is known. Yet if one glances through a textbook of medicine it will be found that heart disorder is mentioned as a complication of many diseases, particularly the infectious diseases, listed therein. While this is true, it is true also that in many diseases, cardiac complications are extremely rare. Certainly the majority of the cases of heart disease do not have a varied etiology.

It is fairly well established that there are three common types of heart disease: rheumatic, syphilitic, and arteriosclerotic. We know definitely the cause of syphilitic heart disease; we are approaching a knowledge of the cause of rheumatic heart disease; but we know nothing of the cause or causes of that form of heart disease which is conveniently described as arteriosclerotic heart disease.

Curves of mortality statistics show that there is a continuous increase in the number of deaths due to heart disease. To approach the problem of prevention in an intelligent manner it is necessary to have, first, a comprehensive knowledge of the incidence of heart disease, that is, an understanding of the size of the problem; second, a knowledge of the causes, more particularly the common causes, if any; and third, a knowledge of the natural history of the different types of heart disease.

Some progress has already been made with regard to our knowledge of the incidence of heart disease. Drolet¹ tells us that heart disease in New York City is now responsible for more than one-fifth of all the annual deaths. He states that in 1925 deaths from all causes in New

* Read before clinic and dispensary workers, arranged by the Joint Program Committee of the Associated Out-Patients Clinics of the New York Tuberculosis and Health Association and The North Atlantic District of American Association of Hospital Social Workers, New York, N. Y., February 10, 1927.

York City totalled 71,864, of which 15,651 were due to heart disease, or a rate of 266 per 100,000 population. The mortality rate for pneumonia followed at 143 per 100,000, cancer at 115 for 100,000 and tuberculosis at 93 per 100,000 population. Yet in 1910, the total deaths from cardiac conditions numbered 8,350, or only one-half of what they are now, the death rate being 175 per 100,000 population, or 34 per cent lower.

These figures show that heart disease is the leading cause of death in New York City now and that it has increased rapidly in recent years. On a basis of similar reports it is estimated that almost 2,000,000 people in the United States suffer from heart disease.

Further data on the incidence of heart disease are given in the result of a study, made by the Heart Committee of the New York Tuberculosis and Health Association in coöperation with the Board of Education, on 1078 newsboys in New York City. These boys ranged in age from 10 to 17. It was found that 16, or 1.5 per cent, had organic heart disease. Among these, more than one-half presented a history of rheumatic infection, especially rheumatic fever; one-third had a history of tonsillitis and no other rheumatic infection and one-third gave no history at all of rheumatic infections.

Similarly I have examined recently, 1000 recruits for the United States Army, drawn from the New York area and ranging in age from 18 to 35. The incidence of heart disease in this group was 15, or 1.5 per cent. These cases all presented the lesions typical of rheumatic heart disease.

These studies, however, do not indicate the entire problem. The figures cited, for example, simply indicate that heart disease as a whole is the greatest single cause of death and that its incidence is rapidly increasing. We desire to know the types of heart disease which make up this total, and their rate of increase or decrease. In this total are there certain forms of heart disease which we can reasonably hope to prevent? and if so, what are they? and are they on the increase at the present time?

Moreover these samples are not sufficient for an accurate knowledge of the incidence of heart disease as it occurs in this country. Studies of samples from various parts of the United States might throw light on the regional distribution of the different types of heart disease, and answer the question as to whether or not a particular climate is conducive to the development of a particular form of heart disease. Furthermore, those studies would emphasize to the public the great economic loss to the country as a result of heart disease.

Strange as it may seem, for centuries heart disease was considered

almost entirely from the viewpoint of structural changes in the heart, that is to say, from the pathological standpoint. The pathologist learned to recognize structural lesions of the heart and the clinician spoke of "myocarditis," "mitral stenosis," and "aneurysm." Such diagnoses were considered sufficiently descriptive of individual cases. Later the interpretation of heart disease from the functional standpoint was conceived; that is, disordered function of the heart, and we began to hear of such functional diagnosis as "cardiac failure," "auricular fibrillation," and "hypertension." Thus we learned to consider heart disease from its pathological or structural standpoint and from its functional aspects.

Within recent years, due in most part to the rapid increase in the incidence of heart disease, the etiology or cause of heart disease has been and is being more carefully studied. So that now heart disease is being considered also from its etiological aspects.

One of the earliest studies on the causes of heart disease, as they are now classified, was made by Cabot² in 1914. His sample for study consisted of 600 hospital cases in which a failing heart was the most notable feature. Briefly, he found that rheumatic heart disease made up approximately 45 per cent of the total; arteriosclerotic and hypertensive heart disease about 34 per cent; syphilitic heart disease 12 per cent; thyroid heart disease 1 per cent; and heart disease of unknown origin 5 per cent.

More recently Wyckoff and Lingg,³ made a study of 1001 cases of heart disease, of which 85.4 per cent were among cardiac clinic patients and 14.6 per cent among private cases. They found that about 25 per cent of the cases presented rheumatic heart disease; about 40 per cent arteriosclerotic heart disease; about 10 per cent syphilitic heart disease; and about 10 per cent heart disease of unknown cause.

Similarly,⁴ I have recently analyzed 1300 cases of heart disease, using for study a mixed group of adults comprising ambulatory cardiac patients attending a cardiac clinic, and hospital bed patients. In this sample, the rheumatic type comprised about 35 per cent of the total; the arteriosclerotic type 33 per cent; syphilitic type 8.5 per cent; and unknown heart disease 20 per cent. All other causes comprised less than 4 per cent of the total.

While the incidence of the different types of heart disease in the studies described differs to some extent with different observers, it is striking to note that over 75 per cent of the cases in these series can be classified under three types: rheumatic; arteriosclerotic and syphilitic. In each study there have been a number of patients with heart disease of unknown cause. In two of the series it is believed that the unknown

group is made up for the most part of patients having rheumatic heart disease in which that disease was the only manifestation of the rheumatic infection.

These figures are significant but similar studies are needed of samples taken from different parts of the country before a comprehensive knowledge of the causes of heart disease is obtained.

It appears that the infectious types of heart disease, which are the rheumatic and the syphilitic, make up from 35 to 45 per cent of all types of heart disease and that the so-called senescent or degenerative form, such as the arteriosclerotic type makes up a like percentage.

ARTERIOSCLEROTIC HEART DISEASE

Considering first, the so-called degenerative types of heart disease—those types associated with arteriosclerosis, arterial hypertension, Bright's disease and those alterations in the heart which occur in old age—have we or can we in the near future, hope for any method for their prevention? Probably not. We have no established facts concerning the prevention of the degenerative types of heart disease. It is true that much has been written of the physical stress and nervous strain of the present-day mode of living as a factor in the production of high blood pressure and hardening of the arteries. Also emphasis has been placed on the rôle of improper diet, obesity, general toxic conditions, overwork, unsanitary conditions, excesses, and focal and general infections as causes of this form of heart disease. While no preventive methods are at present known for this type of heart disease, people can be taught the right way to live. Though we cannot cure this disease, we can hope to relieve some of the suffering produced by it and thus hope to prolong life.

It has been suggested that when the statistics are analyzed further it may be discovered that the increasing rate of deaths actually takes place in this group and not in the infectious group in which the possibility of prevention and cure remains open. That is, if the increase in death rate from heart disease is due to an increase in the degenerative or old age form of the disease, then it might indicate that fewer patients are now dying from preventable disease in youth and middle life. Curves of mortality rates for infectious diseases and for heart disease which Cohn⁵ has had prepared actually suggest this. Practically parallel with a decrease in deaths from the preventable infectious diseases there has been a corresponding rise in the mortality curve of heart disease. This may temper our excitement concerning the increasingly high mortality from heart disease.

SYPHILITIC HEART DISEASE

In the studies cited 8 to 10 per cent of the total number of cases of heart disease observed had their origin in a syphilitic infection—yet syphilis is preventable.

It is known that there is usually a latent period of from 15 to 20 years from the date of the original syphilitic infection to the onset of symptoms of heart disease. No doubt the syphilitic infection has attacked the blood vessels and heart during this period, but the disease is usually not recognized until the onset of the heart symptoms causes the patient to seek relief. Thus there is a period of many years during which adequate treatment might arrest and even cure the disease.

Periodic health examinations, by disclosing the lesions of syphilitic heart disease in its early stages, and systematic treatment would probably prevent serious damage to the heart. Thus if a proportion of this rapid increase in heart disease is found to be due to the syphilitic type, there are known preventive measures and a recognized treatment.

Syphilitic heart disease constitutes a serious problem, for its symptoms make their appearance during the most productive periods in a man's life, that is, between the fortieth and sixtieth years.

Further information is needed concerning the progress of syphilitic heart disease during the latent period.

RHEUMATIC HEART DISEASE

In the studies mentioned, rheumatic heart disease constituted from 25 to 35 per cent of the total. Moreover, it is probably no exaggeration to state that from 1.5 to 2 per cent of the children and young adults in New York City have rheumatic heart disease. Since it is principally an affection of children and young adults, which seriously cripples many of them, our interest is directed particularly to it.

What is the nature of this disease? Until recently, rheumatic fever was regarded generally as having arthritis or inflammation of the joints as its principal manifestation. When heart disease occurred it was considered a complication of the joint inflammation. However, rheumatic fever is now commonly regarded as a general infection, which when it invades the joints causes polyarthritis or "inflammatory rheumatism"; when it lodges in the brain it causes chorea or St. Vitus' dance; and when it involves the heart, it causes rheumatic heart disease. Other evidences of this rheumatic infection may be tonsillitis, muscle, joint or "growing" pains, torticollis, or wry neck, and certain skin conditions known as rheumatic nodules, purpura, and various erythematata.

Rheumatic heart disease is primarily a disease of children and young adults. It is rare after 50 years of age, and the majority of

cases occur before the age of 30. Rheumatic fever usually shows itself in youth as pains in joint or muscle, St. Vitus' dance or inflammatory rheumatism. The heart is often affected simultaneously or just following these ailments. More important still the heart may be the first and apparently the only structure involved, so that there may be present rheumatic heart disease without any other evidence of rheumatic fever.

This is a chronic disease with no definite course, but rather an extremely variable one. Some cases are immediately fatal; some are characterized by more or less continuous active heart infection from first infection to death; some have alternate periods of activity and latency; and some have an initial active period of heart infection and then becomes apparently inactive for a long period of time.

It is thought that rheumatic fever and its various manifestations are caused by a germ, although the exact organism is not known or proved at present. Furthermore, since many attacks of rheumatism are preceded by attacks of tonsillitis, it is believed that the germ causing rheumatism may enter the body through diseased tonsils. Other portals of entry may be decayed teeth or diseased gums, although this is not proved. It seems logical, therefore, that every possible means should be employed to keep tonsils and teeth healthy. If they become infected they should receive appropriate treatment so that germs from these sources may not enter the body.

It is well known that patients with rheumatic heart disease are susceptible to infections of all kinds. Mild infections such as bronchitis, sore throat or "cold," have a bad influence on this type as well as on all other forms of heart disease. Therefore, patients suffering from heart disease should be advised of the value of oral hygiene and the danger of colds, sore throat, and infections.

There are many other factors which demand attention, such as the seasonal variation and family incidence of rheumatic heart disease. One is often impressed with the occurrence of rheumatic heart disease in more than one member of the same family. Many observers have called attention to this. Is there a direct infection from one member of the family to another? If so, measures of isolation such as those employed in the contagious disease should be instituted.

Again it is important to know the incidence of rheumatic fever in our communities and the frequency with which the heart is affected in these cases. Should rheumatic fever be made a reportable disease?

RELIEF OF HEART DISEASE

Considerable knowledge is available at the present time concerning the immediate relief of the symptoms produced by heart disease. This

is demonstrated daily in clinics and practice and it is not my purpose to discuss the treatment of heart disease. But what is known of the end results of treatment, of cardiac vocational guidance and careful social service follow-up? Certainly much is yet to be learned. Furthermore, much more information is needed as to the natural or life history of the different types of heart disease, their respective durations and the effect of remedial measures on their course.

Further study is necessary covering the numerical distribution of heart disease in different parts of the country and the proportion of the various types of heart disease. How many cases are due to infection and how many belong in the degenerative or old age group? What is the effect of treatment on their duration? Is the duration modified by differences in social and economic environment? by convalescent care? and by vocational guidance? Have diseases of the tonsils and teeth a bearing on the incidence of rheumatic infection? What is the direct cause of rheumatic fever?

There is need for carefully collected data dealing with the convalescent care of cardiacs in order to evaluate properly its importance. There is a need for information showing how much and what types of work children with heart disease can do.

The value of careful social service work among cardiac patients is fully recognized, but further study and the collection and critical analysis of more data are necessary before its importance can be fully evaluated.

It is appreciated that the collecting of data is a laborious task, and that the tabulation of those data is still more laborious; but we should appreciate that it is a means at the disposal of all clinic workers, social workers, nurses and physicians of increasing our knowledge of the problem of the prevention and relief of heart disease.

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The Preparation of Acidophilus Milk

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INTESTINAL toxemia and sour milk therapy are subjects that are far from being on a scientific basis. But it has been demonstrated, at any rate, that milk containing lactic acid is more readily digested than "sweet" milk, whether the acid is a result of bacterial activity or a result of the addition of U. S. P. lactic acid, as is the custom in preparing infant feeding formulas. Furthermore, it has been demonstrated that it is possible under certain conditions to implant the acidophilus type of bacillus in the lower intestinal tract of both man and animal to such an extent that it predominates over all other types. No doubt, too much has been claimed for sour milk therapy; yet there is a preponderance of evidence to support the view that the *B. acidophilus* culture may be employed in such a way as to have therapeutic value.¹

In order to have therapeutic value, the culture must contain enormous numbers of bacteria. James² has shown how the average commercial culture falls down in this respect. A large amount of the culture should be taken daily; and lactose or dextrin or some other carbohydrate that is rather slowly absorbed should be fed at the same time.

The kind of culture most satisfactory for supplying the acidophilus organisms in large numbers is a freshly prepared milk culture. Tablets, candies and emulsions have not received the unqualified approval of the Council on Pharmacy and Chemistry,³ and any broth culture which has been kept at a refrigerator temperature cannot contain many virulent organisms on account of the fact that they die out rapidly at low temperatures. In a few cities acidophilus milk may be purchased for from \$.50 to \$1.00 a quart, but it is generally not available at all even at such a price. However, by observing a little care it may be prepared in the home at a very low cost.

The Milk Supply—To start with, the milk must be free from those bacteria which naturally occur in fresh milk. This can be attained by boiling ordinary market milk for a long time, but it has been found that unsweetened evaporated milk is particularly suitable for this purpose. It can be obtained from the grocer at a fair price, can be kept on hand

always ready for use, and it is certainly sterile. Evaporated milk has been sterilized under rather high steam pressure (about 11 pounds); this is sufficient just to begin to caramelize the milk. Kopeloff¹ has shown that when milk is autoclaved to a "light caramel color" the acidophilus organism grows more rapidly in it than in milk heated to a lesser degree.

The Starter Culture—It is now possible to obtain a pure broth culture of *B. acidophilus* at, or through, all drug stores. The product of a reliable manufacturer should be specified. One culture which we obtained proved to be *B. bulgaricus* though it was labeled "*B. acidophilus*."

The Control of Temperature—The acidophilus organism grows best at 90° to 105° F. It exhibits less growth at lower temperatures, though it has been found that the organism produces acid at a considerable rate even at room temperature. (Four observations showed an average increase of 0.65 per cent lactic acid in 24 hours at 68° F.)

Milk that has been inoculated can be warmed to 100° to 105° F. and transferred to a thermos bottle where it will maintain a temperature high enough to permit very satisfactory growth in 15 to 24 hours. The rate at which the temperature falls off depends upon the quality of the bottle and also, of course, on the temperature of the surrounding air. But it has been found that beginning with a temperature of 100° F., a quart thermos bottle of average quality will permit the temperature to drop no more than 10° to 15° in 24 hours. Such temperatures are found quite satisfactory for the rapid production of acidophilus milk.

The Procedure—Carefully clean a quart thermos bottle by allowing it to stand over night full of water containing some washing powder or a little household ammonia; then scald it. Place the cork, a can opener and thermometer in a pan and pour boiling water over them. Wipe the top of a one-pound can of evaporated milk free from dust and pour boiling water over it. Open the can and pour contents into the pan that has been scalded. Fill the can with boiling water and pour into the evaporated milk. Immerse the pan in cool water and stir the mixture with the thermometer until the temperature comes down to about 105° F. Add 2 or 3 ounces of commercial *B. acidophilus* culture, mix, and transfer to the thermos bottle. (The temperature should now be between 100° and 102° F.) Cork and let stand for 24 hours, or until the milk has acquired a pleasantly sour taste. When this is attained, transfer to a clean milk bottle and place in the refrigerator.

Succeeding cultures of acidophilus are prepared by using about a teacupful (6 ounces) of milk culture previous made to inoculate the

diluted evaporated milk for the next run. Proceeding in such a manner, it will be found that acid is produced at a more rapid rate than when the first quart was prepared using the commercial broth culture as a starter. Thirteen to 17 hours is now quite sufficient. If fermentation is allowed to proceed for a longer time so much acid is developed that the taste becomes unpleasantly sour.

After a little experience one may stop the action of the bacteria at any desired degree of sourness. This is effected by merely transferring the milk to a clean glass bottle and placing in the refrigerator. It is perfectly safe to keep the culture at room temperature, but, as has already been mentioned, a considerable increase in acidity may be expected. This is of little consequence, however, if the product is consumed within 24 hours. On the other hand, if the milk is kept in a refrigerator it should be consumed within 48 hours for the reason that the organisms rapidly die out at such low temperatures.

One or two tablespoonfuls of lactose or dextrin may be added to each glass of milk consumed, though the pleasant tart taste of the sour milk is to some extent injured by this addition. Most people prefer to take the carbohydrate separately.

Typical acidophilus milk has a fine grained curd. It is rather viscous, especially at low temperatures, but not "stringy." It does not develop so high an acidity as is produced by the *B. bulgaricus*. When a culture becomes rapidly very sour or bitter and is extremely viscous so that when poured from a bottle it runs out in strings, it is an indication that the culture used was *B. bulgaricus*. This should be discarded and a new commercial culture obtained from a different source. At any time when souring does not seem to be taking place normally a new start should be made.

The nutritive value of this product is exactly the same as that of ordinary cow's milk. Evaporated milk is whole cow's milk evaporated down to one-half its bulk. Therefore, by diluting a can of it with an equal amount of water the composition will be the same as that of normal cow's milk. The evaporated milk flavor, which is objectionable to some people, is scarcely noticeable in acidophilus milk prepared from that product.

Some Experimental Results—A large number of milk cultures have been prepared in thermos bottles on which observations have been made of the influence of (1) the amount of old culture used for inoculation, (2) temperature at beginning of fermentation, and (3) length of time during which fermentation is allowed to proceed. Table I shows the influence of these variables upon the rate of acid development, which is to some extent a measure of the viability of the culture.

TABLE I

INFLUENCE OF AMOUNT OF INOCULATION, TEMPERATURE OF STARTING, AND TIME, ON THE AMOUNT OF ACID PRODUCED BY *B. acidophilus*

Amount of Culture	Temperature	Time in Hours	Per cent Lactic Acid Produced
1 oz (1 cup)	102°	17	0.77
6 oz (1 cup)	102°	17	0.92
9 oz (1½ cup)	102°	17	1.01
6 oz	90°	17	0.88
6 oz	102°	17	0.92
6 oz	105°	17	1.07
6 oz	102°	9	0.68
6 oz	102°	13	0.85
6 oz.	102°	17	0.92

It has been found that acidophilus milk has its best flavor at 0.8 to 1.0 per cent lactic acid. The result of these observations led to the conclusion that the best results are obtained by the use of about one teacupful of old culture to inoculate one quart of diluted evaporated milk, starting the fermentation in a thermos bottle at 100° to 102° F. and allowing the fermentation to proceed for 13 to 17 hours. For the first inoculation, however, where the commercial broth culture is used, fermentation should be allowed to proceed for 24 to 27 hours.

The fact that the commercial culture is much less active than the prepared milk culture when used for inoculation shows how much greater must be the therapeutic value of the latter.

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Salem Sewage Plant

SALEM proposes the second activated sludge plant to be built in Ohio, following closely on the Elyria installation. Plans for the Salem plant were approved in June. The plant is a typical one, comprising presedimentation; aeration by air diffusion with horizontal spiral flow; and separate sludge digestion of mixed fresh and excess activated sludge. F. S. Barckhoff, city engineer, designed the plant, with the assistance of C. C. Hommon, biologist and chemist.

Making Cities Livable

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DURING the country's entire history American cities have grown in haphazard fashion, mixing varnish factories, paint shops, slaughter houses indiscriminately with residence neighborhoods, allowing the development of congestion and potential slum areas to go on with little check. Now, within the short span of 10 years, more than 550 communities have adopted zoning to protect themselves against these developing evils. No doubt because of the very acuteness of its problems, New York, in which zoning was a more complicated and difficult matter than in probably any other city in the country, was the first to undertake zoning.

Although a pioneer in this movement, New York's zone plan has served as a valuable example to the rest of the country. Too much praise cannot be given to the intelligence and wisdom of the group of men who were responsible for the formulation and the enactment of the New York Zoning Law. To take a city the size of New York and divide up its enormous areas into business, residence and industrial zones, and to determine height limitations and open space requirements for these zones was a great task. To have done this in a way that was accepted as sound by building and real estate interests and that has proved, by experience, to be in error in a comparatively small number of cases, was a monumental achievement.

One of the most remarkable things about it has been the fact that not a single case affecting the constitutionality of the New York law has reached the courts. This has been due in no small measure to the wisdom of the promoters of the law in creating a board of appeals with power to vary the strict letter of the law where necessary to prevent unnecessary hardship. Naturally in a city where the land values are among the highest in the world, many compromises had to be made with economic necessity. The standards set are not high enough to protect the outlying districts adequately and they fall far short of being safe for other communities to follow, but nevertheless to New York go the laurels for having established the principle that a city can regulate its building development for the welfare of its citizens.

What it is going to mean to America 50 or 100 years from now to have our cities developing in orderly fashion, with ample space for sun-

light and air in the buildings in which we live and work, and play space for children, should appeal to the imagination of the health worker. The men who have fought the intelligent, persistent battle which has convinced community after community of the need of zoning and who have helped to gain the support of the courts have made a great contribution to the health, comfort and general welfare of our city populations of the next generation. Belief in the importance of zoning to health has been one of the most influential factors in the rapid advance of zoning, and yet it has been a difficult factor to establish because of the lack of conclusive scientific evidence.

The social factors bearing on health are so many and so interrelated that it has not yet been found possible to separate completely the effect of physical environment from such influence as income, race, education and medical service. Nevertheless, fortunately, all the evidence we have from experience and observation makes a case strong enough to have convinced legislators and courts. The city which provides adequate open spaces for all buildings in which people live and work, checks excessive congestion, and keeps objectionable industries out of residential neighborhoods, should certainly be more healthful than one with the haphazard building development that has characterized the typical modern city.

There is little doubt that the time will come before many years when we shall have scientific data to prove our case conclusively. Meanwhile practical considerations indicated that, rather than go on piling up trouble for ourselves in the future, the sensible thing to do was to act upon the evidence provided by our experience and by the testimony of competent people, and proceed to attack the problem without waiting for more scientific data.

Certainly there can be no question that when we build hospitals and sanatoria for the sick we build them with ample open spaces to insure an abundance of sunlight and fresh air. No one would advocate that, pending the producing of conclusive evidence to the contrary, we should put these institutions in congested areas with no thought of sunlight and air. If these considerations are important in nursing the sick back to health they are no less important in maintaining the health of all.

Nothing in the modern progress of medical science has been more important than the proof of the value of sunshine. If sunshine will both cure and prevent rickets, if it is a great aid in the treatment of tuberculosis of the bones and joints, if it is helpful in building up vitality and resistance to disease in children and in adults, then we have a strong argument for controlling city development in such a way as to

prevent congestion and guarantee open spaces sufficient to permit some sunshine to enter. So strong is the case for the value of the sun's rays that the day is probably not far distant when we shall require all residences to be so oriented as to provide the maximum of sunshine in living rooms and when we shall require in new buildings window glass that will not screen out the ultra-violet rays.

More is known about ventilation than ever before. The fundamental requisites are motion, temperature and the proper amount of humidity. For schoolrooms modified window ventilation has proved to be the most desirable of all known methods. The adequacy of open spaces surrounding structures will certainly play an important rôle in determining whether these air conditions can be provided. Obviously, the room facing on a narrow court will have little air motion and in summer will have an excessive temperature.

The fact that those sections of a community in which the infant mortality and the death rates from tuberculosis are highest are usually those in which the congestion is greatest and the open spaces least, furnishes strong evidence that these conditions are factors perhaps of equal importance with low income, race and education. A recent study of infant mortality in Cincinnati has shown among other things that in the wards having the highest density of population the death rate among children under 1 year of age is appreciably higher than in the others. Drolet in his study of tuberculosis among the Jews of New York City produced facts indicating that while there is a distinctly favorable racial resistance to this disease, it is significantly more deadly in the congested tenement areas even though the economic status is not greatly different.

Where any factor so consistently accompanies high death rates from this disease, the presumption is strong that it cannot be eliminated as a cause. There has been a strong tendency to discount the influence of physical environment because of the fact that, without any great change in environment, it is possible to reduce mortality by means of improved medical and nursing care, education, better nutrition and other methods used in the modern health movement. This view, however, overlooks the fact that this improvement is made in spite of the environmental handicap and with no knowledge of the extent to which bad environmental conditions definitely limit the extent of our progress in the poorer city districts, or how much greater the results might be if the physical surroundings could be transformed.

It is noteworthy that Seattle, Wash., which stands among the highest of all cities in its percentage of home ownership, is among the lowest in infant mortality rates. Dr. Leonard Hill, the noted English

authority in his book *Health and Environment*, points out that in England "rural districts still maintain the relative advantage over town districts which held in the olden days," despite the enormous amount of health work in cities.

The effect of permitting the intermingling of business and industry with residences is certainly not conducive to health promotion, though its ill effects do not lend themselves to ready measurement in terms of vital statistics. We must not lose sight of the fact that the goal of the public health movement is not alone the prevention of disease and premature death. Our objective is positive health building—achieving such robust health, mental and physical, as will make life enjoyable to its fullest extent. It would be an unusual person indeed who would argue that this objective is fostered by the congestion, noise, odors and smoke of the modern city. Smoke in particular is an evil which accompanies the business and industrial districts to an extent that is unnecessary in home neighborhoods. Smoke interferes with the sunlight, and deprives a community of a great deal of the beneficial sun's rays that it would otherwise have. Dr. Leonard Hill, in his book previously referred to, says:

The great medicinal value of sunlight in a cold climate is only very slowly being recognized. In some districts in England, owing to smoke, people in certain localities receive 50 per cent less actinic rays of sunlight than others only four miles distant from them.

The committee on Public Health of the New York Academy of Medicine in a statement published in the bulletin of the Department of Health of New York City on February 27, 1926, states, that it "viewed with great concern the health hazard which has been created of late by the continual, and to a large degree preventable, discharge of dense smoke into the air." The interference with the beneficent action of the actinic rays of the sun by the all-pervading smoke is detrimental to health, particularly of children. As time goes on we shall learn more and more in the way of definite facts regarding the detrimental effect of these things upon health, comfort and efficiency.

Keeping business and industry out of residential districts and increasing the size of open spaces greatly reduces the danger of fire and the resultant probability of injuries and deaths due thereto. The 1925 *Fire Prevention Year Book*, published by the Baltimore Underwriters, states that the fire hazard is almost seven times as great in buildings used entirely for business as in buildings used entirely for residences.

Leading psychiatrists and neurologists have testified that the protection afforded to residential districts by means of zoning is beneficial

to mental health. Horatio Pollock, statistician of New York State Hospital Commission, has shown that mental disease is much higher in urban than in rural districts of New York State. "The man of the rushing nerve-racking city is most likely to become insane," says Dr. Pollock, "while the woman of the more placid country district has the best chance of not suffering from mental disease."

Regardless of the dearth of incontrovertible scientific data on the relation of zoning and housing to health, few will challenge the conclusion that the city of the future which provides better housing, eliminates congestion, guarantees a reasonable amount of light and air for all buildings for human habitation, and keeps business and industry out of residential districts, is making for the day when people on the whole will enjoy more complete health. It is these considerations, along with evidence and testimony showing the relation to safety, to traffic congestion, to morals, to the cost of city utilities, and to convenience and economy in transportation, that have led the courts to declare zoning legal.

The past ten years have been crucial ones for the cause of zoning. At no time has there been any certainty that the courts would not yield to the cry of "taking property without due process of law," and deprive all cities of the benefits of zoning. Hundreds of cases have been heard, and step by step the case for zoning has been strengthened until now there is no longer any doubt of its validity. A reading of the many excellent opinions that have been handed down shows how strongly the health arguments have influenced the courts.

Edward M. Bassett of the Advisory Committee on City Planning and Zoning of the Department of Commerce, and one of the great leaders in the cause of zoning from the beginning, has prepared a statement recently published by the department entitled "Zoning Progress in the United States," in which he gives the present status of zoning from the legal point of view. Zoning was a wide deviation from anything that had been done in the past, affecting as it did every parcel of land existing in the community, setting a standard as to the use to which the land might be put, the height to which the buildings might be erected, and the open spaces required around them. It was a momentous thing for the judiciary to declare so radical a measure constitutional. The fact has been recognized, however, that the development of the large city has brought with it dangers that necessitate an entirely new type of regulation to prevent city conditions from becoming intolerable.

Zoning is done under the police power, which is that right of a community to enact necessary laws and regulations without having to

compensate the owner for any adverse effect he may believe such regulations may have upon his property values. Regulations adopted under the police power must be reasonable, must be applied equally, and must be based upon the health, safety, morals and general welfare of the community. Zoning has definite limits and Mr. Bassett points out that the community which attempts to zone without recognizing these limitations is very likely to find its zone plan invalid.

1. It is necessary that there be a state enabling act granting to communities specifically the power to regulate the height, bulk and use of buildings, the size of courts and the density of population.

2. There must be a careful scientific study of the needs of the community, public hearings and comprehensive and impartial application of the regulations.

3. There must be requirement of more than a majority vote of the council to effect changes after written protest of property owners.

4. There must be provision for a board of adjustment with power to vary the strict letter of the law and the maps, to avoid unnecessary hardships.

The constitutionality of zoning based on an enabling act and having due regard for these essentials has been upheld by the courts of every state where it has been tested except in New Jersey and Georgia. The most important decision ever rendered on the subject was that handed down in 1926 by the U. S. Supreme Court in the Euclid Village case. In that important opinion, almost every phase of modern zoning was referred to, and the court made it clear that intelligent, reasonable and systematic zoning is a proper exercise of the police power. With more than 30 million people, comprising over 55 per cent of the urban population, already protected by zoning, it certainly will not be long before every sizable municipality in the country will be included in the list. Few measures so drastically affecting property rights on the one hand and human welfare on the other have made such rapid progress.

Establish New Quarantine on Mussels

EXAMINATION of mussels, made recently by Dr. K. F. Meyer, director of the Hooper Foundation for Medical Research and consulting bacteriologist of the California Department of Public Health, has determined the presence of a toxic condition in these crustacea. A quarantine order was issued immediately upon the determination of these findings. The general public is warned to beware of eating mussels taken from the coast district specified in the quarantine order.

The Place of the Nursery School in a Public Health Program*

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THE value of schools for young children has long been recognized in certain countries. In Belgium, as early as 1833, official recognition was given to such schools, and in 1905 there were 2,711 schools in that country for children from 3 to 5 years of age. These schools accommodated 258,149 children, a number probably representing half of all children of these ages in the country.

In France also the need for such schools has been admitted. The first school in France for children under 5 years of age was founded in 1771. In 1897, about 25 per cent of the children from 2 to 6 years of age in France were attending school. In 1904, there were 217 schools in Paris for children from 2 to 6 years of age. These institutions were educational, though probably not to the extent that we now expect them to be.

The first English nursery school was opened in London in 1900. Only a small number of nursery schools were established in England before the war, although the subject had received thorough and favorable consideration, as evidenced by the voluminous report published in 1908. In 1918, the Fisher Act provided for the establishment of nursery schools in England, in connection with the national education system. Their growth was somewhat retarded, however, by post-war conditions, and especially, economic conditions.

The educational advantages of the nursery schools have been widely discussed, and they are now well established, but the physical advantages, though even more evident, have not been discussed in the literature.

It is a well-known fact that most children reach the age of 5 or 6 years with physical defects which need correction. Many of the defects are so serious that the children are classified as abnormal. Yet medical literature gives abundant evidence that many of these defects are preventable. Therefore, medical practice with children has assumed, to no small extent, a preventive rôle.

The purpose of such preventive work is twofold—to develop proper

* Read before the Wayne County Medical Society, Detroit, Mich., March 27, 1928.

habits, and to give remedial attention at the proper time. Proper remedial care will prevent the development of more serious defects. It frequently consists of correcting improper habits. Proper food is a necessary corollary to the developing of proper habits. The early development of good food habits is generally admitted to be of great value; yet it is not uncommon to see clinic children whose families cannot afford to give them an adequate diet. Moreover, the indigent family and the family of moderate or good circumstances have given little real study to the preparation of the dietary and its presentation to the child. It is unusual, in fact, to find a family which has given thorough consideration to the proper methods of child care. Such a condition may be explained partly by failure to recognize the importance of early training; partly by ignorance, poverty, and lack of proper personality; and to a considerable extent by the conditions of city life, which necessitate living under conditions which make good child training impossible.

We believe the nursery school offers the best means of solving these problems, which are really public health problems.

Let us consider for a moment the objectives of the care and training of young children. They may be summed up as follows:

To offer a proper environment for physical welfare, growth, and development.

To offer opportunity for the best mental and social development.

To offer opportunity to make as many judgments as possible.

To offer as many educational opportunities as possible, that is, opportunities to learn how to do new things, things the child did not know how to do.

These objectives necessarily dovetail to some degree, since the final aim is an environment that gives opportunity for all-round development. If these objectives are approved, and it is admitted that the nursery school, combined with a program of parental education, may go far toward meeting them, we shall be asked for the group of children to which the nursery school will be advantageous.

It is too early in the history of the nursery school to say that it is the best place for all young children. However, it is safe to say that it would be advantageous to many children who do not now have its benefits, and that it would be of great value to practically all the children of the poorer classes and to many from the better classes of society. I believe that the nursery school is the best method yet proposed for caring for a large proportion of the children of large cities, and that the movement should be extended to accommodate such groups.

It is equally true, however, that the extension of this service must necessarily be slow. Nursery schools should not be established until properly qualified teachers and staffs are available. The need for such

restriction was recognized in the English report of 1908, which has the following statement:

The committee deprecate very strongly the idea which appears to be prevalent that any teacher is good enough for infants. They hold, on the contrary, that the care of these young children presents difficulties at least equal to those which arise in teaching the older ones, and the infant teachers should be selected with scrupulous care. . . . In the case of normal children more good can be done by education between the ages of 3 and 5 than at any subsequent period of 2 years; and experience shows that attendance at school before 5, even under the present conditions, undoubtedly helps in the great majority of cases the subsequent education.

Nursery schools should not, then, be organized more rapidly than proper personnel is available. The nursery school staff should have proper training and experience, favorable personalities, and should be free from any disease that would be a hindrance in the work.

The advantages of the nursery school are numerous, and though we are considering them chiefly from the point of view of physical welfare, it is true that the physical, mental, and social life and development of the young child are so interrelated that they cannot easily be thought of separately. The following are some of the advantages:

It provides an opportunity for parental education. Whether we are considering nursery schools, summer camps, clinics, or other health procedures for children, unless the parents are shown the value of the régime and coöperate with it, much of the effort is wasted. *The American nursery schools have definitely included parental education as a part of their program.*

The nursery school relieves the mother from the care of the child for a part of the time. This advantage is an important one from several points of view. That this very relief lessens parental responsibility and is therefore undesirable is a favorite point for critics of the nursery school to dwell upon. However, the nursery school does not take the child away from the mother for so long a time as some assert, and placing the child in the nursery school, when there is a program of parental education in connection with the school, actually increases the sense of parental responsibility. The objective of the nursery school is to supplement, guide, and indicate parental responsibility, not to replace it. It might easily be shown that the mother who has a few hours apart from the child each day for undivided attention to her other duties gives more and better planned time to the child after he returns from the nursery school. The busy child at home gets in the busy mother's way, and too many commands are necessary. The results are not the best for either the mother or the child.

In the home, the little child is not usually the most important consideration in making plans for the day, as he is in the nursery school.

In the nursery school, a teacher well trained in methods of dealing with young children is always present to give guidance when it is needed. She is better able to deal with the child's problems than is the mother, in most instances.

In the nursery school, the child is in an environment planned to meet his needs, with the proper equipment and materials available. Here he can make and carry out his plans, which is conceded to be an important part of the education of the young child, without undue interference. He has other children to play with and learn from. He learns how to live in the group and how to give and take. The equipment for both outdoor and indoor play is selected by competent people, to allow the best opportunity for the development of muscle and muscle coördination, and general body and mind control. It is, of course, more adequate than the equipment most homes can afford. The child in the home quickly outgrows toys and play equipment. The equipment in the nursery school is not outgrown, for the children there are always from 2 to 5 years of age.

It will be conceded that the child should have a maximum amount of free play in the open air. It will also be admitted that many city homes do not have facilities for outdoor play, and that, when they do, the mother is often called upon to follow or worry about every movement, with a result that could hardly be called either free play for the child or enjoyment for the mother. At the nursery school, plenty of space for outdoor play, as much time as weather conditions permit, play equipment, companions of the same age, and adequate supervision, are provided.

When lunch time comes at home, the mother is often busy, and sometimes has not planned the meal ahead; therefore, it is likely to be inadequate for the young child. In the nursery school, the meals are planned ahead, as the chief consideration is the welfare of the child, and the nursery school dietary furnishes those things most likely to be insufficiently represented in the home diet. Further, as it is generally considered best for the young child to have his main meal at noon, the nursery school provides this meal, carefully planned and selected, and the home coöperates by giving the child a breakfast and dinner complementary to this lunch. The nursery school teaches good food and health habits through example and practice, and the "social pressure" exerted by the other children makes the teaching of health habits easier than in the home.

In *The Normal Child—Its Care and Feeding*, Alan Brown makes the following statements:

The food suitable for the second year of life and the method of its preparation and administration are subjects upon which the masses are most profoundly ignorant. A few children at this period of life are underfed, but the great majority are overfed; they are carelessly given, at improper intervals, unsuitable food, wretchedly cooked. . . .

With many children this expansion of the diet list is attended with considerable difficulty. They are thoroughly satisfied with the milk and refuse all other forms of nourishment. In such cases time and patience are necessary at feeding time. . . .

A child should never dine with adults until he can have an adult diet, if circumstances of the family will permit him to dine alone or with other children. It is a species of cruelty to expect a hungry child of tender age to sit at the table, see and smell fragrant dishes, and be forced to content himself with his restricted fare without complaining. . . .

It may be safely said that a well, vigorous child is a hungry child; and nearly every child may be made thoroughly hungry three times a day by giving suitable foods at proper intervals. The children who come to a physician for poor appetite without evidence of disease to account for it are, almost without exception, improperly fed. They are often given unsuitable food at mealtime, when they are loaded down with sweets and pastries; but the chief error is eating between meals. This habit has ruined more appetites and has been the cause of more stomach disorders than any other one factor. . . .

Children who overexert themselves at school or at play, or who are easily excited and have plenty of opportunity for excitement, often suffer from loss of appetite. The management of these cases is to remove the source of the trouble, whatever it may be. An excellent means is an enforced rest for one and a half hours after the noonday meal.

Dr. Brown is quoted at length because the problems he discusses are so fitted for nursery school attention and because the nursery school has been so successful in dealing with them. Moreover, these problems are preventable if proper care is taken early. A properly ordered nursery school teaches habits that prevent these undesirable practices. If established, such habits yield better to the nursery school régime than to any other method of treatment.

Regular physical examinations and physical measurements, as well as measurements of mental and social progress, are a part of a properly conducted nursery school program. Such measurements need not be sufficiently elaborate for research purposes, but must be sufficiently thorough to show the course of development the child is taking.

The importance of the nursery school as a center for a public health program with young children is indicated by the fact that the English nursery schools were developed because of the health advantages to the children, as pointed out by Sir George Newman, Chief Medical Officer of Great Britain. The English nursery schools were established in an attempt to solve the problem presented year after year by the many children entering the elementary schools with defects of health apparently developed during the preschool years. During the 1926-27

school year, the Detroit Department of Health examined 26,878 first grade children.¹ Of these children, 64.6 per cent were found to have one or more physical defects. If one may assume, as seems reasonable, that this condition is representative of the country at large, the importance of attacking health problems during preschool life, in this country as in England, is evident.

In the United States, the primary purpose of the nursery school has been to develop an institution that helps parents in caring for and directing their children, as well as to supply an environment that offers the child the best possible opportunity for an all-round development, physical, mental, and social. Nursery school history in this country is of less than 7 years' duration. Its growth has been satisfactory. Close association with the universities of the country has kept the standards high and encouraged an attitude of investigation for the best methods of development. The leaders in the field believe that the increase in the number of nursery schools should be as rapid as trained personnel becomes available, but not more so.

From experience covering 6 years, the staff of the Merrill-Palmer School believes that the nursery school offers the best method of dealing with the greater proportion of children from 18 months to 5 years of age. They believe that it is the best place to develop proper habits and that it gives the best opportunity for physical and mental growth and development. Because of these advantages, the medical profession should be familiar with the opportunities the nursery school offers as a foundation for a public health program with young children and the parents of young children.

REFERENCE

- ¹ *City Health*, Bulletin of the Detroit Department of Health, Jan., 1928.

Tuberculosis Directory Published

HELPFUL to directors of local health departments and private health agencies is the Tuberculosis Sanatorium and Association Directories, recently published, which lists 1,454 organized state and local associations and 282 special committees which assist in the various phases of tuberculosis work. This directory is available from the National Tuberculosis Association, 370 7th Avenue, New York, N. Y.

Nutrition Experiments in the Schools of Winston-Salem, N. C.

ELEANOR WHITTINGHILL

Nutritionist, Department of Health, Winston-Salem, N. C.

THE aim of our nutrition program has been to prevent unnecessary illness and to increase the efficiency of the human body by teaching nutrition and its relation to health in such a way that the child will appreciate its value and be able to practice it intelligently in the home. We chose animal experiments to stimulate an interest in the effect of good and poor nutrition. The Home Economics and Physical Education Departments coöperated with the City Health Department in conducting these experiments.

Our purpose in conducting these experiments has been to show the effect of special foods on the growth and health of young rats and thereby stimulate in the child an interest in his own well-being. The foods and drinks used represented some of those generally used by the children of this city—coffee, candy, milk, lettuce and soft drinks.

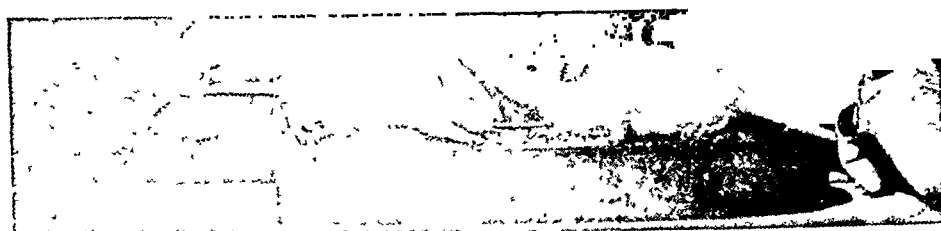
White rats, cages, a pair of accurate scales measuring in grams, and other necessary equipment were provided. The Home Economics Department seemed to be the logical place for the rats to be kept, because of the accessibility of food and water and because of that department's interest in nutrition.

A list of instructions was placed in the hands of each home economics teacher, relative to the kind and amount of each food to be used for each group of rats per day. Their basic food consisted of white corn meal and salt, (5 cupfuls of corn meal to 1 tablespoonful of salt). The "special" foods: milk, coffee, soft drinks, sugar and lettuce, were fed in amounts that could be disposed of readily, only one "special" food being used at a time.

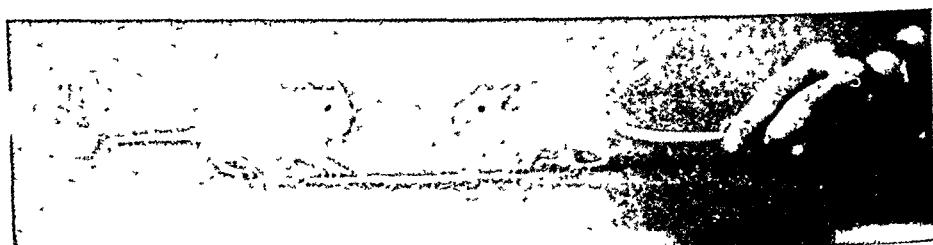
RATION

Coffee	2	tblsp	per	rat	per	day
Soft drink	2	"	"	"	"	"
Milk	2	"	"	"	"	"
Lettuce	About 15	gm	per	rat	per	day
Candy or sugar	3	"	"	"	"	"
Meal	All they could use					

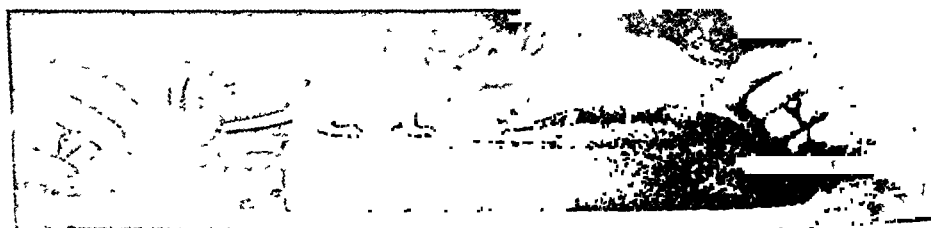
Once each week each group of rats was weighed. These weights were recorded on posters (made for the purpose), and kept on the bulletin board in the hall, where all of the children could read them.



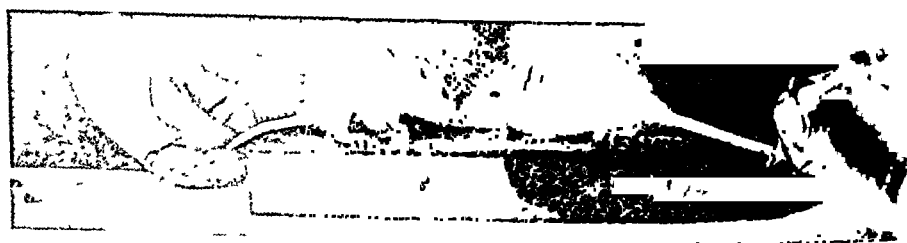
LITTER 93 gm 125 gm MILK 86 gm. 166 gm.



COFFEE 93 gm 94 gm MEAL 85 gm. 106 gm.



SUGAR 99 gm 91 gm MILK 86 gm. 166 gm.



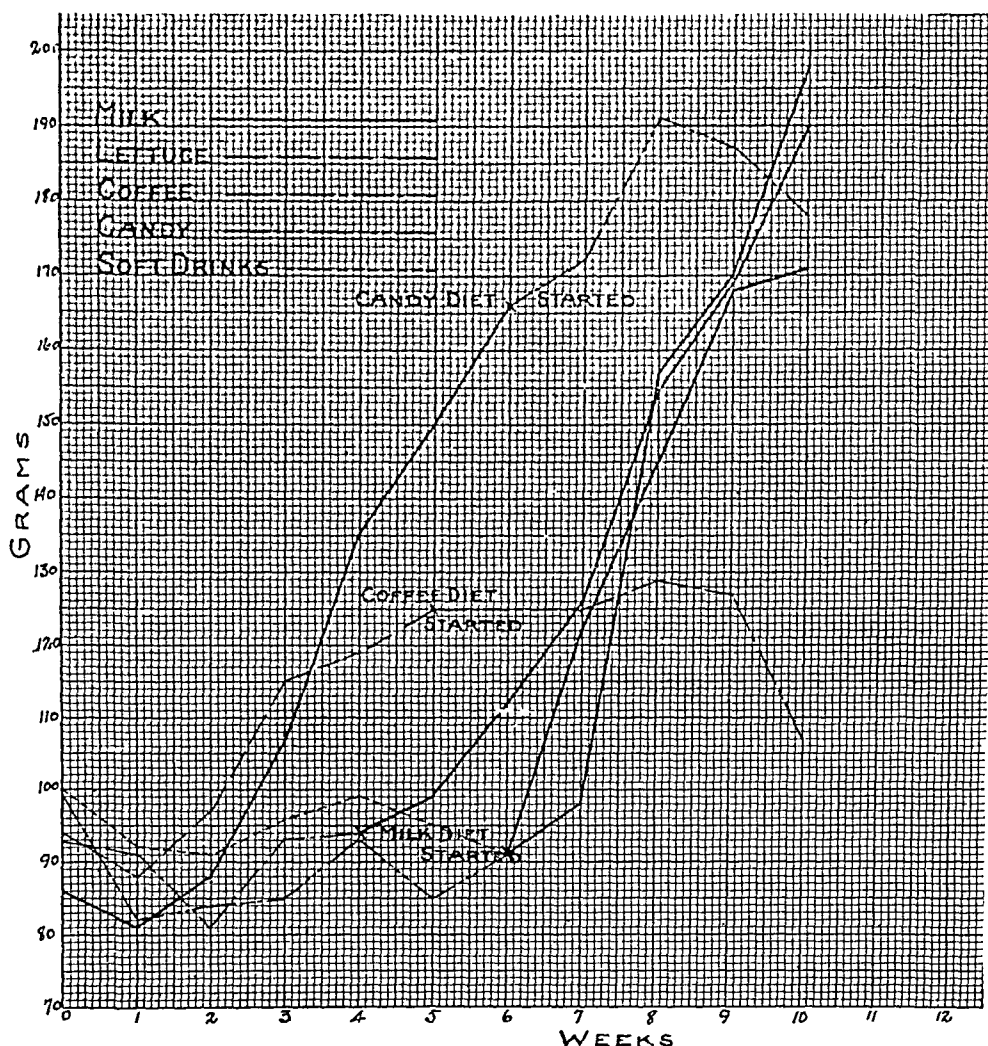
SOFT DRINKS 100 gm 91 gm. MILK 86 gm. 166 gm.

Just to show the effect of food on the growth and health of young rats would not be so important in itself; but the child quickly applied to himself what he had learned. One child remarked: "Now I see the value of this; you are showing us what good nutrition will mean to us." The interest was keen and the value of the experiment was proved when the children began to change their habits in eating. In many

instances milk took the place of coffee, candy was reserved for after meals, lettuce and salads became more popular, and fewer soft drinks were purchased.

The following graphs represent the weight in grams, per week, for

WEIGHT IN GRAMS PER WEEK FOR PAIR OF RATS



the pair of rats. The rats' response to the change in food is also represented on the graph. Note the immediate increase in weight when milk is added and the decline in weight when coffee is added.

All of the rats were 4 weeks old when the experiment began. They were from the same family and had the same treatment. At the end of 6 weeks on "special foods," the pictures were made. The weights are for two rats of like experiment, made at the beginning and at the end

of the 6 weeks' experiment. (Only one rat from each experiment is shown in the pictures, that a comparison may be made, with one fed on milk or on some other food.)

Animal experimental work stimulates an interest in personal well-being.

A Heating Factor Which May Explain the Winter Cold

IN a restricted, but at the same time, the most generally accepted sense, ventilation may be defined as the maintenance of healthful atmospheric conditions. A most important factor among these conditions is that of temperature. Perhaps not enough attention has been given to the source and nature of the heat which is customarily used in maintaining a comfortable temperature in the winter season. If there is something in the matter of ventilation, and particularly heating, that predisposes to the "winter cold," as is commonly asserted, may it not be the usual forms of heating themselves—hot air furnaces, steam, hot water, coal stoves, and the like, and, because these emit energy from but one end of the spectrum, the dark heat rays"? Such sources of heat are, of course, devoid of the shorter visible and ultra-violet rays which characterize sunshine and daylight, the health giving and disease resisting qualities of which are universally admitted. In short, perhaps the "winter cold" is due to too constant exposure to a "partial spectrum"—the long rays. A truly radiant source of heat to maintain the room temperature, such as the glowing fireplace, the radiant electric coil, the radiant type of gas stove, etc., or the campfire of old, all of which supply a quite complete spectrum—comparable to the sun's rays at sea level—might be the answer to the "winter cold," or, it might be possible to secure the beneficial results by using the present sources of heat for bringing the room temperature up to 50°-60° F. and using the "radiant type of heater" for the balance necessary for comfort.

To prove or disprove this theory, would require, it seems to the writer, a considerable group of persons, preferably of all ages, and under 24-hour daily control, so far as interior existence is concerned, for a period of perhaps 5 years. Retention institutions, or perhaps founding homes, with their attendants, suggest themselves as proper places for investigating the subject, where some of the inmates could be left under the present mode of heating, and the others required to depend upon heat from a glowing radiant source for comfort.—Emery R. Hayhurst, M.D., Ohio State University.

University Degrees in Public Health*

THE report of the committee consists of two tables presenting data concerning candidates for and recipients of public health degrees during the year 1927, and replies to an inquiry sent to schools granting the Doctor of Public Health degree.

TABLE I

NUMBER OF STUDENTS ENROLLED AND PUBLIC HEALTH DEGREES CONFERRED IN 1927 IN COURSES REQUIRING AT LEAST ONE YEAR OF RESIDENCE AND LEADING TO A PUBLIC HEALTH CAREER

School	Degree	No. Enrolled 1926-1927	No. of Degrees Conferred 1927
University of California	Dr.P.H.	0	0
	M.A.	1	1
	A.B.	13	7
DeLamar Institute of Public Health, Columbia University	M.S.	1	1
Detroit College of Medicine and Surgery	Dr.P.H.	0	1
			honorary
University of Georgia	D.P.H.	0	1
	M.S.	0	0
	B.S.	2	2
Harvard School of Public Health	Dr.P.H.	5	1
	M.P.H.	11	7
	C.P.H.	8	5
Johns Hopkins School of Hygiene	Dr.P.H.	13	8
	Sc.D. in Hygiene	33	11
	C.P.H.	23	16
Massachusetts Institute of Technology	S.B. in P.H.	26	6
	C.P.H.	4	1
	Dr.P.H.	2	1
McGill University	Ph.D.	7	2
	D.P.H.	0	0
University of Michigan	M.S.	11	4
	D.P.H.	3	1
	M.A.	2	1
University of Minnesota	B.A.	2	2
	D.P.H.	0	0
University of Montreal	D.P.H.	0	0
Ohio State University	M.S.	4	1
University of Pennsylvania	Ph.D.	1	1
	Dr.P.H.	0	0
Queen's University	D.P.H.	0	0
University of Toronto	Ph.D.	1	0
	M.A.	2	1
	D.P.H.	6	4
University of Western Ontario	D.P.H.	0	0
Yale School of Medicine	Dr.P.H.	1	1
	Ph.D.	10	5
	C.P.H.	5	5
	M.S.	2	1
Total		199	98

* Report of the Committee on Training and Personnel of the American Public Health Association for the calendar year 1927.

TABLE II

NUMBER OF DEGREES IN PUBLIC HEALTH GRANTED IN UNITED STATES AND CANADA IN 1927

Degree	Degrees Granted	Schools Offering the Degree
Certificate in Public Health	27	4
Doctor of Public Health	12	6
Doctor of Science in Hygiene	11	1
Doctor of Philosophy (Public Health or Hygiene)	8	4
Bachelor of Science (Public Health or Hygiene)	8	2
Bachelor of Arts in Hygiene	9	2
Master of Science (Public Health or Hygiene)	7	5
Master of Public Health	7	1
Diploma in Public Health	6	7
Master of Arts in Hygiene	3	3
	—	
Total	98	

THE HONORARY DOCTOR OF PUBLIC HEALTH DEGREE

Believing that the Doctor of Public Health degree should not be granted as an honorary degree but that it should be granted only upon the completion of a definite and adequate program of training, the committee has sought to ascertain the attitude of the various schools. In reply to inquiries sent to all schools which have granted the Doctor of Public Health degree, the following conditions have been reported:

Harvard University, Johns Hopkins University, Massachusetts Institute of Technology, University of California and Yale University give the Doctor of Public Health degree in course, but they have never given an honorary Doctor of Public Health degree and the faculty representatives upon this committee state that it is contrary to the policy of these institutions to do so. The University of Michigan gives the Doctor of Public Health degree in course, but it has discontinued by faculty action the policy of granting the honorary Doctor of Public Health degree.

In Canada, at Queen's University, McGill University, University of Montreal, University of Toronto and University of Western Ontario, the Diploma in Public Health is offered as a degree in course, but never as an honorary degree.

Detroit College of Medicine and Surgery, University of Georgia, and University of Pennsylvania offer the Doctor of Public Health degree in course and have also given it as an honorary degree. The committee representatives from these schools state that the schools are opposed to granting the honorary Doctor of Public Health degree frequently or as a routine procedure, but they believe the schools are not willing as yet to surrender the occasional privilege of giving it to exceptional individuals.

The other institutions which offer public health training have not up to the present time offered the Doctor of Public Health degree.

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The Continuous Clinic

THE continuous clinic has been carried out in small towns and rural communities of Geary County, Kan., with apparent satisfaction to all concerned—the underprivileged child, the profession and those contributing funds.

A limited fund for this health work was obtained by means of the Christmas Seal sale. When the physicians, dentists and optometrists were approached for their coöperation, without exception they offered their services. Following the conclusion of preliminary arrangements two blanks were printed and distributed.

The method for locating worthy and needy patients for the clinics is simple. Whenever a school nurse, teacher or other responsible person discovers a child who is in need of a tonsillectomy, spectacles or dental work, or a nutritional case where the economic condition of the family does not permit proper provision for the child, she fills out Blank 1, which states that the child is in need of dental, throat or eye work, and is financially unable to take care of it. Upon receipt of Blank 1 by the director of the clinic, Blank 2 is sent to the parents with the request that they fill it out and return to the clinic director. Blank 2 is really a contract between the doctor or dentist and the child. Corrective work may be done then or at a time more convenient to patient and physician or dentist. When the service is completed the blank indicating the work that has been done is returned with the charges. The charges are paid from the fund, which closes the case.

This plan for the Continuous Eye, Throat and Dental Clinic which has been in operation in Junction City for more than a year has advantages over other plans tried, because,

1. In a small community there are seldom enough cases to require a special day set apart for that purpose.
2. It gives us time to inquire and ascertain that the child is really in need of the work and is unable to pay for it from the family income.
3. It enables the doctor, dentist or eye man to coöperate to better advantage and still not absent himself from his office for several hours at a time.
4. The child going to the doctor by regular appointment is often saved from the feeling of pauperism.
5. This plan avoids the criticism expressed by some that public clinics are a direct step toward obligatory state medicine—R. B. Stafford, M.D., Health Officer, Geary County, Junction City, Kan.

EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

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FIFTY-SEVENTH ANNUAL MEETING

ONCE each year in an unbroken series, from 1872 to 1927, the American Public Health Association has brought together at its Annual Meeting the public health profession of the North American Continent.

The 57th Annual Meeting which will be held at Hotel Stevens, in Chicago, October 15-19, 1928, promises to equal or exceed any previous meeting in size, interest and scientific value. Not since the Semi-Centennial in 1921 has an Annual Meeting had such an auspicious setting. The program, which is printed in this issue, is one of great merit, and exceeds in variety those of previous years.

The Local Committee has planned so generously for trips of scientific and general interest, for entertainment for delegates, and especially for ladies, that it has been impossible to give more than an outline of their plans in the space available in the JOURNAL.

This Annual Meeting of the American Public Health Association will be enriched by the presence of many members of nine other organizations. The American Child Health Association will hold its Annual Meeting jointly with us. Simultaneously there will be held the Annual Meeting of the Illinois Conference of Health Officers and Public Health Nurses. There will be meetings also of the International Association of Milk and Dairy Inspectors, American Social Hygiene Association, Conference of State Sanitary Engineers, Conference of State Laboratory Directors, Women's Foundation for Health, Association of Women in Public Health, Association of School Physicians.

It is only at infrequent intervals in the course of the public health movement on the North American Continent that there is brought together at one time and in one place such a galaxy of leaders. No stretch of the imagination is needed to picture the significance of such

an event. The younger members of the profession will be able to see, hear and meet those more experienced leaders whom they have previously followed only through the printed page. Old friendships will be brought up to date and new ones will be made. The isolated worker who has been fighting single-handed will give and gain strength by his presence.

The older leaders will be encouraged in their hopes by seeing many young recruits. There will be much of technic—purely professional patter—but meaningful. There will also be let loose those forces more difficult of measurement which bind together those facing a common task.

Will you be there?

PRESENT STATUS OF CHEMICAL FOOD PRESERVATIVES AND COLORING MATTERS

THE addition of chemical preservatives to foods has been a matter for hot discussion over many years, and in this country has even played a part in politics. During the World War regulations were relaxed, and until recently no authoritative statement of the laws in various countries has been available. We owe to The Office International D'Hygiène Publique a report which gives the regulations in eighteen countries, Germany being the most important one for which there are no data.

It is possible to give only a general summary, as the preservatives allowed in different countries vary considerably, and in some, the United States for example, there are general laws carried out by regulations. In this country the law prohibits the use of any poisonous or injurious substances which may affect the healthfulness of the food, certain chemicals, such as salicylic and boric acids, the borates and formaldehyde being forbidden. In the case of foods for use on ships the external application of certain preservatives is allowed, but they must be such as can be easily removed mechanically, or by soaking in water, or by other processes, and a label must be attached giving directions for this.

The artificial coloration or decoloration of foods has reached the point of being a fine art. A great variety of coloring matters is allowed, and on this account the regulations regarding this matter are much more inexact than are those concerning preservation. For the most part, the coloring matters used at present are coaltar derivatives, and in the United States one is required to use materials which have been certified by the proper officers. It will be remembered that fairly

recently the use of nitrites instead of nitrates has been allowed to give the red color to corned beef and similar products.

It is interesting to note that formaldehyde is not recommended by any country, and its use is specifically forbidden in many, including England, Canada, Australia, the United States, Bulgaria, and France. New Zealand, Sweden, Switzerland, England, Bulgaria, and the United States prohibit the use of boric acid or its compounds, while Canada, France, and some other countries allow it in such foods as butter, condensed milk, cream, and margarine, under restriction as to the amount. The United States, England, Bulgaria, and France prohibit the use of salicylic acid, while a number of other countries allow its use in minimum amounts. Benzoic and sulphurous acids are allowed more widely than any other preservatives. In England and Wales these are the only preservatives permitted and their use is restricted to certain foods and within definite limits as to quantity. France forbids the use of benzoic acids and benzoates.

In studying the bulletin¹ one is impressed by the fact that there is greater uniformity in the countries which have reported than there was a few years ago. Certain preservatives are quite generally prohibited or their use limited, and there is considerable uniformity in the sanction of certain preservatives for the same foods.

The matter is one about which there is some room for difference of opinion. The safe rule is to allow only those preservatives which, after extensive trial or prolonged use, have been proved harmless. In general, chemical preservation should be restricted as far as possible, especially in view of the almost universal refrigeration which is now available. The addition of preservatives makes it possible to put foods on the market which are unfit for use, and advantage is taken of this fact by some manufacturers. It may be said with certainty that the more nearly foods are used in their fresh and natural condition, the better for the consumer, the less the danger of injury by poisoning, acute or chronic, and the surer we are of not destroying certain valuable properties belonging naturally to the foods.

REFERENCE

1. *Supplément au Bulletin Mensuel*, t. XX, no. 3, mars, 1928.

TULAREMIA

THIS disease, which is now attracting considerable attention, was first described by McCoy, in 1911, as "a plague-like disease of rodents," having been found in the routine examination of these animals carried on in San Francisco. The causative organism was named *Bacterium Tularense*.

In 1919 and 1920, Dr. Francis, of the U. S. Public Health Service, found the same disease in Utah, gave it its present name, and showed that it was spread by the deer fly. In that section it was known as "deer fly fever." It is called by market men, "rabbit fever," owing to the fact that in the East, at least, it is kept alive in wild rabbits, and they are the chief source of infection for man. In this section, November, December and January are the months in which the majority of cases occur, since vast numbers of these animals are killed and sold for food.

The germ was isolated in 1912 by McCoy and Chapin. Spleens and livers of infected animals contain the germs.

The disease is extremely infectious and every laboratory man who has worked with the germ in this country and in England has contracted it. In nature, the deer fly (*Chrysops discalis*) and the wood tick (*Dermacentor andersoni*) are apparently the chief agents in conveying the disease from animal to man. Under laboratory conditions, the mouse louse, the bedbug, the stable fly and the squirrel flea have been shown to be capable of transmitting the germ. Ticks harbor the infection in their feces, their circulatory fluid and in the epithelial cells of their intestinal tract. The germ is able to survive the winter in the tick, and may be transmitted from stage to stage in the development of the tick, and is transmitted through the egg to the next generation. Even the handling of an infected tick appears to produce infection, though the sucking period is the dangerous time. Certain flies seem to carry the infection for four days at the longest. The deer fly is commonly found on horses in Utah from May to September. The woodtick is found in Montana and adjoining states, and is active in March, April, May and June. In other parts of the country, the ordinary wild rabbit seems to be the important source of infection. West of the Mississippi River, the jack rabbit is the chief agent in spreading the disease. It is used for bait, the feeding of chickens, dogs and foxes, as well as for the table.

During the last few years, a number of cases have been reported from states in the East. Most of these have been found in and near Washington, D. C., probably due to the activity of Dr. Francis in that area. Twenty-two cases have been recorded, and of the patients, 17 have been engaged in dressing rabbits for the market.

The disease is not very fatal, the mortality being about 4 per cent. Among 420 recorded cases, 17 deaths have occurred, but these include only cases reported to the U. S. Public Health Service, which up to the present has been the body which has shown the greatest activity in studying the disease and its epidemiology. Cases have been

reported from 37 states, the District of Columbia and Japan, but none from the 9 New England States, the only area in this country known to be free.

There are two general types of the disease—one in which the glands become enlarged and painful, and are apt to go on to suppuration, and the other, seen in laboratory workers, which resembles typhoid fever. Fever, running as high as 104° , is always a symptom, and persists for from 2 to 3 weeks. The diagnosis is confirmed by agglutination with a known culture.

Special precautions must be taken in the diagnosis by agglutination, similar to those for typhoid fever. The reaction is absent during the first week, but comes on in the second week, often in low titer, though occasionally it will show agglutination in a dilution of 1 to 500 or even higher. The maximum agglutination appears during the third and fourth weeks. Agglutination in dilutions of 1 to 1200 is not uncommon, and takes place even up to 1 to 2500. At least 0.5 c.c. of blood is required, and more than this quantity is desirable. The reaction is very persistent, lasting for five years or more. No preservatives other than pure neutral glycerin should be added.

The disease has never been observed in domestic animals. There is no special treatment, no preventive vaccine, no curative serum, and no drug has been found which has any specific effect.

Fortunately the germ is easily killed in cooking, 133° F. being sufficient. Those who dress rabbits for market should wear rubber gloves, and since one attack protects against another, immune persons should be employed in this work as far as possible. Freezing for 30 days will render dead rabbits free from danger. Market inspection is of little value since the organs which carry infection—the liver and spleen—have been removed in dressing. Health officers and physicians who are called to cases which are not easy of diagnosis should remember to look for tularemia.

TERMINAL DISINFECTION

THIS subject has not been much discussed in the United States for some years past. As early as 1912, Charles V. Chapin, M.D., for the first, as far as we are aware, showed the doubtful value of terminal disinfection both as an abstract proposition and as actually practiced. He discontinued terminal disinfection for certain diseases in the City of Providence as early as 1905. In 1914 it was discontinued in certain boroughs of New York City, and in Manhattan on January 1, 1915. Convincing figures were collected by Dr. Chapin, and later by the

authorities in New York, to show that the discontinuance of terminal disinfection had not led to the increase of contagious diseases. An enormous amount of money was thereby saved without detriment to the public health. While other cities have followed suit, the practice is still continued in many places, and without doubt has a strong hold on the public as well as the profession.

The matter was called to the public attention last year by a masterly presentation by Dr. Carlos Chagas,¹ and more recently by a translation and reproduction of his article in England.² In this country it would seem almost unnecessary to comment upon this subject except for the widespread sale of disinfectants, good, bad, and indifferent, and the frequent advertisement of alleged new discoveries of germicidal substances, though we believe that these appear much less frequently than a few years ago, when scarcely a week passed without some alleged discovery. The great majority of these preparations were coal tar products, and their relative value depended upon the amount of a few active substances which they contained, and upon their miscibility and solubility. One has only to consult the table worked out by the late Dr. McClintic³ to become convinced of the lack of value of many of these preparations. The names of them often indicated the known chemical upon which their value, such as it was, depended. It was always cheaper and better to use the chemicals, which were easily obtainable from wholesale houses in greater or less degrees of purity.

A survey of disinfection as practiced in various countries has convinced Dr. Chagas that the procedure was almost always useless, based on incorrect ideas, and the results not commensurate with the expense, conclusions which had been reached by Dr. Chapin and others many years ago. While these procedures have had a certain educational value, and have allayed the fears of nervous people, their actual value has been slight. Unfortunately, if disease germs are scattered through premises in which contagious diseases have been treated, it is impossible in most cases to locate them, or to influence them through any "process of camouflage," as it has been called by Dr. Balfour. It has been wisely taught for some years that a properly cared for case of contagious disease should not be allowed to contaminate the surroundings. Dr. Chagas stresses the point that the great objection to terminal disinfection is not so much its uselessness as a preventive measure, but the fact that it seems necessary. The real danger from a contagious disease lies in the excretions from the body. Disinfection of the sputum, excreta, and pathological discharges, should be carried out during the progress of the case rather than after death or recovery,

since whatever danger is possible has already occurred and late disinfection cannot do away with it.

Patients suffering from communicable diseases must be protected during their illness. Clothing, bedding, towels, utensils, and all other objects which are used or which come into contact with the patient should be promptly disinfected. The high value of hot water and soap, sunshine and fresh air must not be forgotten. It is expensive and impracticable to increase the rigor of terminal disinfection to a point where it will be absolutely effective.

Dr. Chagas takes up in detail a number of contagious diseases to demonstrate his ideas and one cannot read his arguments without being convinced of the soundness of his reasoning, backed up as it is by an extensive experience.

As Americans, we take pride in the fact that, as far as our knowledge goes, Dr. Chapin preceded all others in these ideas and in the practical demonstration of their soundness; but we welcome the clear presentation given by Dr. Chagas in corroboration of what we have believed and practiced for a number of years.

REFERENCES

1. Office International d'Hygiene Publique. *Bulletin Mensuel*, May, 1926, p. 484.
2. Wm. Hodge & Company, Ltd., Glasgow, 1928.
3. *Bull. Hyg. Lab., U. S. P. H. S.*, No. 82.

CHILD WELFARE IN CHICAGO

HEALTH workers who attend the 57th Annual Meeting in Chicago in October will have an exceptional opportunity to see the results, in child welfare work, of earnest coöperation between private social agencies and the public officials of that city, especially the Department of Health. Child welfare activities in Chicago, as in other large cities have grown to include a wide and varied range of endeavor. The Chicago Local Committee is making arrangements so that those who attend the convention may see the outstanding work of the Chicago Health Department, the Infant Welfare Society, the Visiting Nurses' Association, the Elizabeth McCormick Memorial Fund, the Illinois Institute for Juvenile Research, the Juvenile Court and the Juvenile Protective Association, together with that of other child welfare agencies.

Child Welfare activities in Chicago may be grouped as prenatal, infant welfare, preschool, and school. Chronologically, work for the school child was the first to be started. In 1896, medical inspection of school children for contagious diseases was instituted. In 1908, this was expanded to include physical examinations for defects, and a corps of nurses was added to do the follow-up work in getting these defects corrected.

At the present time, with the exception of special nutrition work being done by the Elizabeth McCormick Memorial Fund and tuberculosis prevention by the Municipal Tuberculosis Sanitarium, all health activities in the public and parochial schools are carried on by the Department of Health. The school physicians of this department work in three groups, as follows:

One hundred and twenty-two physicians visit the schools daily to inspect for

contagious diseases; each physician is permanently assigned to a district and is held responsible for the schools within that area. Fifty-two physicians conduct thorough physical examinations of the children in the kindergarten and primary grades, and routine reinspections of the 6th and 8th grade children graduating into the junior and senior high schools. Ten to 20 physicians are assigned to the administration of toxin-antitoxin, making Schick tests and vaccinating against smallpox. During the 5 school days each week, they spend their time in the schools, but on Saturdays they render this service to infants and preschool children at the infant welfare stations and other health and social centers. The nursing staff assists these physicians in all the above mentioned activities and carries out the necessary follow-up work.

Defects discovered by physicians conducting physical examinations are corrected by private physicians, dispensaries and such special agencies as the Illinois Society for the Prevention of Blindness, The Chicago Heart Association and many others. Dental care is provided through the private dentists at 12 dental clinics maintained in the schools by the Department of Health; the Municipal Tuberculosis Sanitarium at the 8 dispensaries; the children's dental clinic at the Cook County Hospital and the clinics of the dental colleges.

A discussion of the health work in the schools would not be complete without mentioning the home hygiene courses given to grammar school pupils of the parochial schools by the American Red Cross and the Chicago Department of Health; through these classes 60,000 boys and girls have received instructions in home health, and, to some extent,



CALIFORNIA
PARK
HAS ITS
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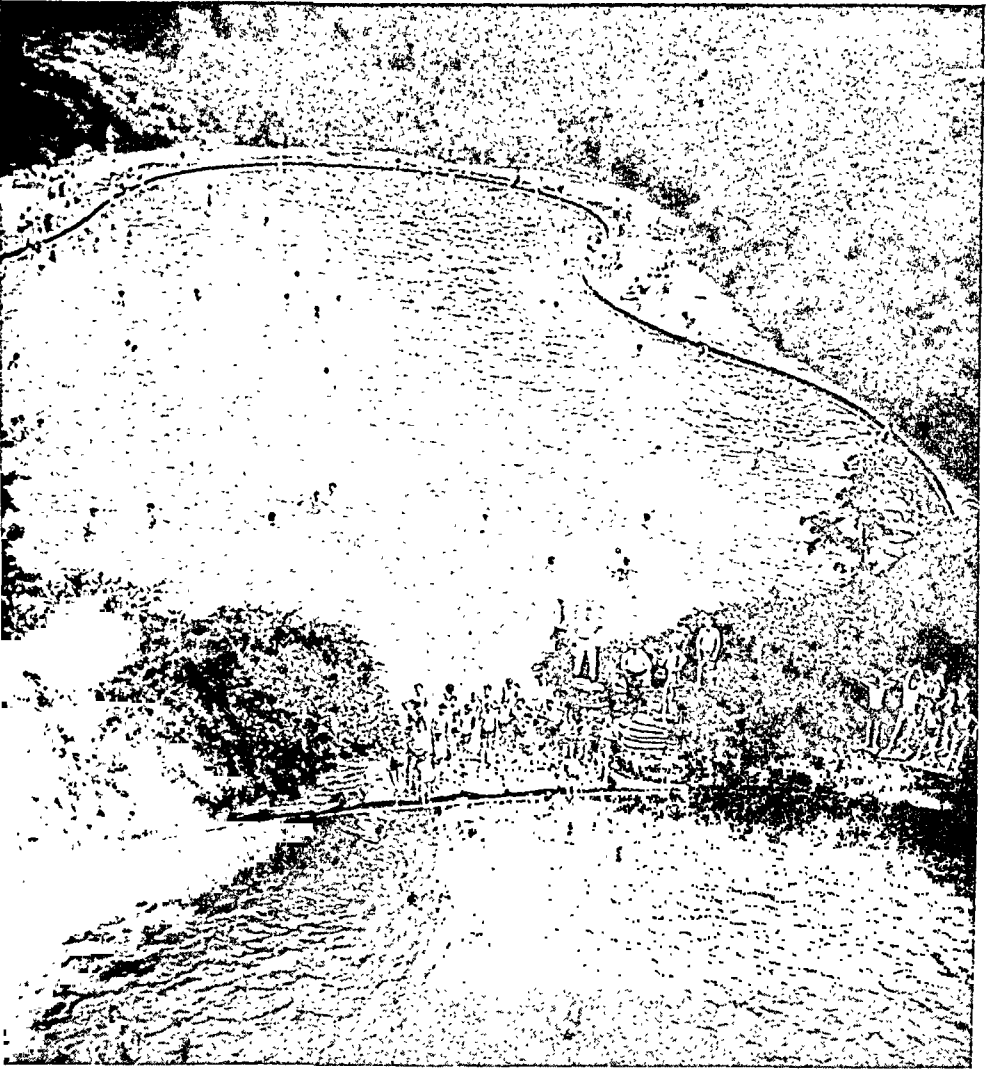
Chicago Herald-Examiner

HOW MUCH
HAVE THEY
GAINED?

A story told at
one of Chicago's
Infant Welfare
Stations



Underwood & Underwood

*Chicago Herald-Examiner*

SWIMMERS ENJOY THE POOLS IN COLUMBUS PARK

home care of the sick has been taught.

After the inauguration of health work in the schools, the next large child health effort had its beginning in 1899, when Dr. A. R. Reynolds, then Commissioner of Health, assigned 73 volunteer physicians during the hot weather to mother and infant care in the thickly populated and poor sections of the city.

In 1902, the Milk Commission began and continued for 8 years to prepare and distribute to needy mothers clean modified milk.

Infant welfare as it is today had its beginning in 1909 in a coöperative movement of the United Charities, the Visiting Nurse Association and the Department of Health and including, of course, the work of the Milk Commission already existing, to lower further the infant mortality rate. Important as this work was, and though it accomplished much, it was decided that one organization would be more effective, and consequently all baby welfare agencies were reorganized into a single private agency,



Chicago Herald Examiner

CEREAL TASTES MIGHTY GOOD AT THE PRESCHOOL CONFERENCE

the Chicago Infant Welfare Society. Today this organization conducts 23 stations, for the most part situated in the poverty area surrounding the "Loop," where the infant mortality rate is highest.

In 1913, cooperating with the Infant Welfare Society, the Department of Health entered this field and is now conducting 22 stations in the more outlying districts outside the zone of activity of the Infant Welfare Society. By mutual agreement, each organization confines its work to its own districts and a mother is allowed to transfer from one district to another only by special permission.

These early activities in infant care proved their effectiveness by markedly lowering the infant mortality rate. However, it was found that before this rate could be lowered further the prenatal, natal and preschool periods must also be given careful attention, as the death rate in these periods remained un-

changed. Consequently, both the Infant Welfare Society and the Department of Health expanded the station work to include prenatal and preschool care. The society now has 10 prenatal and 17 preschool conferences. The Department of Health has 6 prenatal and 14 preschool conferences. As the physical care of the child has been perfected, a realization of his mental needs has developed; to meet this need the Infant Welfare Society has added a trained psychiatric social worker to its staff to aid in discovering and caring for behavior problems among children.

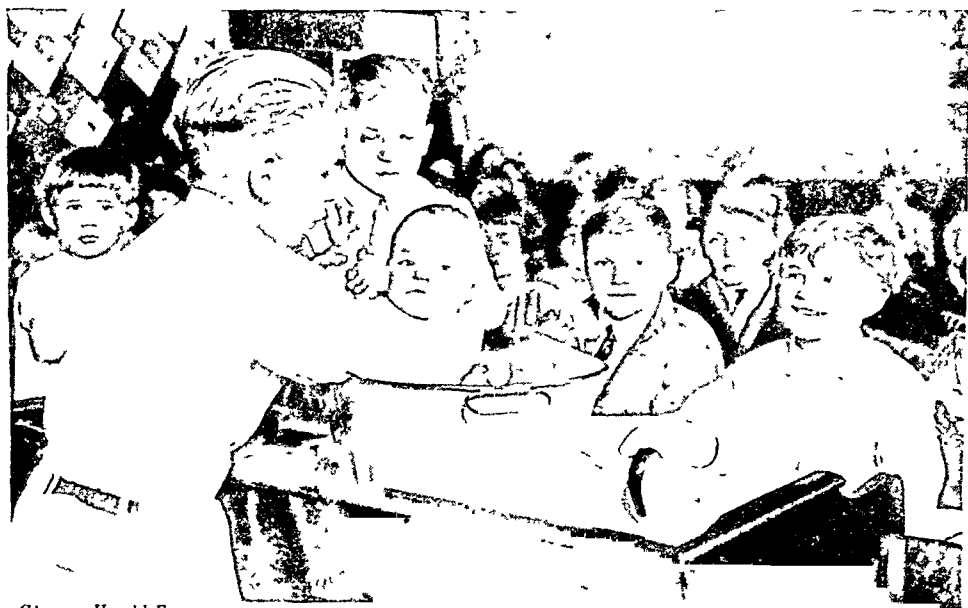
With the recently aroused interest in the preschool child, especially from the standpoint of behavior, the nursery school has come into vogue. There are three remarkable examples of this type of education in Chicago, namely the University of Chicago Coöperative Nursery School, The Nursery School of the Franklin Public School and the Mary Crane Nursery School at Hull House.

Beside the activities of the Infant Welfare Society and the Department of Health in the prenatal field, much work is being done by other organizations. The Chicago Community Trust, in 1922, in their survey of prenatal care in Chicago found 32 organizations conducting prenatal conferences. Outstanding is the work of the Chicago Lying-in Hospital and its 2 out-departments. All the medical schools and many of the hospitals conduct prenatal conferences.

With so many agencies at work in one field of endeavor, it is inevitable that there is much dovetailing and overlapping and even duplication of effort. Much of this is now eliminated by the clearing of all cases through the Social Service Exchange. Mutual understanding and coöperation of the agencies are promoted by the Chicago Council of Social Agencies. As an example of the coöperative effort, the Mary Crane Nursery School at Hull House deserves

special mention. In this project, handling about 53 school children, the educational work is carried on by the National Kindergarten and Primary College of Evanston, the medical and nutritional work by Chicago Infant Welfare Society, the mental hygiene by the Illinois Institute for Juvenile Research, the dental work by the Chicago Department of Health and the social work by the United Charities.

A final word must be said of the outdoor facilities for play and recreation with which Chicago is so wonderfully supplied. In all parts of the city are small parks and playgrounds with organized and supervised activities. There are many miles of beach along the lake shore and thousands of acres of forest preserves just outside of the city limits. Certainly, these features are no small adjunct in aiding these other human agencies in maintaining a high standard of child welfare in this community.



Chicago Herald Examiner

LEARNING FATHERCRAFT AT ONE OF THE RED CROSS HOME NURSING SCHOOLS

PRELIMINARY PROGRAM OF THE FIFTY-SEVENTH ANNUAL MEETING

AMERICAN PUBLIC HEALTH ASSOCIATION

Chicago, Ill. October 15-19, 1928

DELEGATES are urged to consult the final program at the meeting for information as to the exact time and place of sessions. All meetings will be held in the Hotel Stevens. Morning sessions will be at 9:30; luncheon sessions at 12:30; afternoon sessions at 2:30; dinner sessions at 6:30; and evening sessions at 8:30.

GENERAL SESSIONS

First Session—Monday Evening

Addresses of Welcome.

Address of the President of the American Public Health Association.

HERMAN N. BUNDESEN, M.D., Health Director, Chicago Sanitary District, Chicago, Ill.

Address of the President or of a Representative of the American Child Health Association.

Second Session—Wednesday Evening

Report of the Committee on Dairy Products. WILLIAM H. PARK, M.D., Director Health Department Laboratories, New York, N. Y.

Organizations for the Care of the Sick. W. S. RANKIN, M.D., Duke Endowment, Charlotte, N. C.

How To Use Effectively Civic Groups in Promoting Health Programs. E. L. BISHOP, M.D., State Health Commissioner, Nashville, Tenn.

International Health. FRANK G. BOUDREAU, M.D., Health Section, League of Nations, Geneva, Switzerland.

Banquet—Thursday Evening

Program in Charge of Local Committee

SPECIAL SESSIONS

CANCER

Special Session—Wednesday p. m.

Program arranged by the President

COMMITTEE ON TRAINING AND PERSONNEL

Dinner Session—Wednesday

(This is an open meeting of the committee to which everyone is invited.)

Minimum Training For All Persons Entering the Public Health Profession.

Presiding, C. E. TURNER, DR.P.H., Professor Department of Biology and Public Health, Massachusetts Institute of Technology, Cambridge, Mass.

Discussion. JOHN SUNDWALL, M.D., Director, Division of Hygiene, Public Health and Physical Education, University of Michigan, Ann Arbor, Mich.

EPIDEMIOLOGY

Special Session—Thursday p. m.

The Age Distribution in Milk-borne Outbreaks of Scarlet Fever and Diphtheria. EDWARD S. GODFREY, JR., M.D., Director, Division of Communicable Disease, State Department of Health, Albany, N. Y.

A Further Epidemiological Study of Undulant Fever in Michigan. PAUL F. ORR, M.D., Commissioner of Health, Toledo, O.

Epidemiological Studies of 83 Cases of B. Abortus Infection. A. V. HARDY, M.D., State Epidemiologist, Iowa City, Ia.

A Series of Typhoid Cases Infected per Rectum. CLIFFORD R. HERVEY, M.D., District State Health Officer, Oswego, N. Y.

Water-borne Epidemics of Diarrhea in Illinois. THOMAS G. HULL, PH.D., Diagnostic Laboratory, State Department of Public Health, Springfield, Ill., LLOYD ARNOLD, M.D., Associate Professor of Bacteriology and Preventive Medicine, University of Illinois College of Medicine, Chicago, Ill., and HARRY F. FERGUSON, Sanitary Engineer, State Department of Health, Springfield, Ill.

An Epidemiological and Bacteriological Study of Epidemic Meningitis in Chicago. ALTON S. POPE, M.D., and JOHN L. WHITE, M.D., Department of Health, Chicago, Ill.

Racial Distribution and the Death Rate of Diphtheria in New York City. HAVEN EMERSON, M.D., Department of Public Health Administration, Columbia University, New York, N. Y. (*Stereopticon Illustration*.)

Discussion. EDWARD S. GODFREY, JR., M.D., State Department of Health, Albany, N. Y.

JOINT SESSIONS

HEALTH OFFICERS AND THE AMERICAN SOCIAL HYGIENE ASSOCIATION

Joint Luncheon Session—Monday

MUNICIPAL CONTROL OF VENEREAL DISEASES

Chairman, C. HAMPSON JONES, M.D., Commissioner of Health, Baltimore, Md.

Discussion. HENRY F. VAUGHAN, D.P.H., Commissioner of Health, Detroit, Mich., WALTER M. BRUNET, M.D., Secretary, Social Hygiene Committee, New York Tuberculosis and Health Association, New York, N. Y., EARLE G. BROWN, M.D., Secretary, Kansas State Board of Health, Topeka, Kan., and ALBERT PFEIFFER, M.D., Director, Division of Social Hygiene, State Department of Health, Albany, N. Y.

LABORATORY AND FOOD, DRUGS AND NUTRITION SECTIONS

Joint Session—Monday p. m.

Colon-Aerogenes Group in Milk. EDMUND K. KLINE, DR.P.H., Jefferson County Board of Health, Birmingham, Ala.

Recent Observations upon the Detergent Action of Dairy Washing Compounds. MILTON E. PARKER, Technologist, Philadelphia Dairy Products Company, Inc., Philadelphia, Pa.

Heat Resistant and Heat Loving Bacteria in Pasteurized Milk. ROBERT S. BREED, PH.D., Chief in Research, Agricultural Experiment Station, Geneva, N. Y. (*Stereopticon Illustration.*)

Failure of Standard Method for Visible Dirt in Milk to Meet Connecticut Requirements: Need for New Standard for Market Milk. FRIEND LEE MICKLE, M.S., Director, Bureau of Laboratories, State Department of Health, Hartford, Conn. (*Stereopticon Illustration.*)

Discussion. Opened by ROBERT S. BREED, PH.D., Chief in Research, Agricultural Experiment Station, Geneva, N. Y.

Viability of *B. Typhosus* in Cheddar Cheese. E. M. WADE and LEWIS SHERE, State Department of Health Laboratories, Minneapolis, Minn.

CHILD HYGIENE AND PUBLIC HEALTH NURSING SECTIONS WITH AMERICAN CHILD HEALTH ASSOCIATION

Joint Session—Tuesday a. m.

MATERNAL MORTALITY

Presiding: FRED L. ADAIR, M.D., Professor of Obstetrics and Gynecology, University of Minnesota Medical School, Minneapolis, Minn.

Report of the American Public Health Association, Child Hygiene Section, Committee to Report on the Status of Maternal and Infant Mortality. *Chairman,* JULIUS LEVY, M.D., Consultant, Bureau of Child Hygiene, State Department of Health, Trenton, N. J.

Discussion

Report of Sessions on Maternal Mortality in the Conference of State Directors of Maternity and Infancy Work, U. S. Children's Bureau, April, 1928. BLANCHE M. HAINES, M.D., Director of Division of Maternity and Infant Hygiene, U. S. Children's Bureau, Washington, D. C.

Discussion. LILLIAN R. SMITH, M.D., Director, Bureau of Child Hygiene and Public Health Nursing, State Department of Health, Lansing, Mich.

Report of Section of Obstetrics, Gynecology and Abdominal Surgery of the American Medical Association. CARL H. DAVIS, M.D., Chairman, Section of Obstetrics, Gynecology and Abdominal Surgery of the American Medical Association, Milwaukee, Wis.

Discussion. WILLIAM C. DANFORTH, M.D., Fellow, American Gynecological Society, Evanston, Ill.

Report of Maternity Center Association Experiences in Tioga County, N. Y. HAZEL CORBIN, R.N., General Director, Maternity Center Association, New York, N. Y.

Discussion. GUY S. CARPENTER, M.D., Chairman of Public Health Committee of Tioga County Medical Society, Waverly, N. Y.

HEALTH OFFICERS, PUBLIC HEALTH NURSING AND CHILD HYGIENE SECTIONS WITH THE AMERICAN CHILD HEALTH ASSOCIATION

Joint Session—Tuesday p. m.

Studies on Infant Mortality. GEORGE T. PALMER, D.P.H., Director, Division of Research, American Child Health Association, and DOROTHY F. HOLLAND, Ph.D., Staff Associate, American Child Health Association, New York, N. Y.

Discussion. PHILIP VAN INGEN, M.D., Professor of Clinical Pediatrics, Columbia University, New York, N. Y.

General Discussion

Pediatric Service in City Health Department Centers Provided by Medical Schools in Boston. HAROLD C. STUART, M.D., Department of Child Hygiene, School of Public Health, Harvard University, Boston, Mass.

Discussion. WILLIAM H. PETERS, M.D., Commissioner of Health, Cincinnati, O.

General Discussion

Result of the National Congress of Parents and Teachers 1927 Summer Round-up of Preschool Children. MARY E. MURPHY, Director, Elizabeth McCormick Memorial Fund, Chicago, Ill.

General Discussion

SYMPOSIUM ON PRESCHOOL HEALTH SUPERVISION

In the Small Towns and Rural Areas. ELIZABETH M. GARDINER, M.D., Director, Division of Maternity, Infancy and Child Hygiene, State Department of Health, Albany, N. Y.

In a Small City. B. K. KILBOURNE, City Health Officer, Fargo, N. D., and LESTER J. EVANS, M.D., Child Health Demonstration Committee, New York, N. Y.

In a Limited Area of a Large City. GRACE L. ANDERSON, R.N., Director, East Harlem Nursing and Health Service, New York, N. Y.

In a Large City. By a Voluntary Agency Acting for the City Health Department. SARA B. PLACE, R.N., Superintendent, Infant Welfare Society, Chicago, Ill.

PUBLIC HEALTH ENGINEERING AND LABORATORY SECTIONS

Joint Session—Friday a. m.

SYMPOSIUM ON RESEARCH IN SEWAGE AND INDUSTRIAL WASTE DISPOSAL

Can Garbage be Digested with Settling Sludge? GORDON M. FAIR, Assistant Professor of Sanitary Engineering, Harvard University, Cambridge, Mass. (*Stereopticon Illustration.*)

Some Biochemical Factors in Sewage and Sludge Treatment. WILLEM RUDOLFS, Chief, Department of Sewage Disposal, Agricultural Experiment Station, New Brunswick, N. J.

Discussion. 20 minutes

Comparison of Stream Flow and Diffused Air Aeration in Purification of Packing House Wastes. MAX LEVINE, PH.D., Professor of Sanitary Bacteriology, HARRY N. JENKS and GEORGE NELSON, Iowa State College, Ames, Ia.

The Relation of Sulfite Reducing Bacteria in Sewage. FRANK E. GREER, Principal Bacteriologist, Department of Health, Chicago, Ill.

Discussion. 20 minutes.

Need for Coördination of Research in Sewage and Industrial Wastes. CLARENCE M. BAKER, Engineer, American Paper and Pulp Association, New York, N. Y.

CHILD HYGIENE AND PUBLIC HEALTH EDUCATION SECTIONS WITH THE AMERICAN CHILD HEALTH ASSOCIATION

Joint Session—Friday a. m.

SCHOOL HEALTH EDUCATION

EFFORTS TO DATE TO DEFINE OBJECTIVE STANDARDS IN HEALTH EDUCATION

A Review of School Health Work. JAMES F. ROGERS, M.D., DR.P.H., Chief, Division of Physical Education and School Hygiene, Bureau of Education, Washington, D. C.

Discussion. This paper will be discussed through progress reports of present-day school health studies, as follows:

Health Education Studies Carried on by the University of Michigan. JOHN SUNDWALL, M.D., Director, Division of Hygiene, Public Health and Physical Education, University of Michigan, Ann Arbor, Mich.

Educational Tests in American Child Health Association School Health Study. RAYMOND FRANZEN, PH.D., Research Director, School Health Study, American Child Health Association, New York, N. Y.

LABORATORY

First Session—Tuesday a. m.

Report of the Committee on Training and Personnel—*Laboratory Section Representative*, JOHN F. NORTON, PH.D., Director of Laboratories, Department of Health, Detroit, Mich.

Standardization of the Wassermann Test. Report of Progress for 1928. (Report of the Committee on Standard Methods.) *Referee*, RUTH GILBERT, M.D., State Department of Health, Albany, N. Y.

Report of the Committee on Standard Methods. *Chairman*, E. O. JORDAN, PH.D., University of Chicago, Chicago, Ill.

Report of the Committee on Abstracts in the Journal. *Chairman*, C. C. YOUNG, D.P.H., Director, State Department of Health Laboratories, Lansing, Mich.

SYMPOSIUM ON UNDULANT FEVER

B. abortus in Milk and its Relation to Undulant Fever. CHARLES M. CARPENTER, PH.D., New York State Veterinary College, Diagnostic Laboratory, Cornell University, Ithaca, N. Y., and MERRILL J. KING, M.D., Director, John R. Hegeman Laboratory, Metropolitan Life Insurance Company, Mt. McGregor, N. Y.

Further Observation on Human Infection with B. abortus. JAMES G. McALPINE, PH.D., Storrs Agricultural Experiment Station, Storrs, Conn., and FRIEND LEE MICKLE, M.S., Director, Bureau of Laboratories, State Department of Health, Hartford, Conn.

Studies on Blood for Undulant Fever, Endemic Typhus and Tularemia. WILLIAM S. LITTERER, M.D., Director, State Department of Public Health Laboratories, Nashville, Tenn.

The Differentiation of Species of the Genus Brucella. I. F. HUDDLESON, D.V.M., Michigan State College, East Lansing, Mich. (*Stereopticon Illustration.*)

Study of Methods for Isolation of B. abortus. RUTH GILBERT, M.D., M. B. COLEMAN and W. M. GROESBECK, State Health Department Laboratories, Albany, N. Y.

Unsolved Undulant Fever Problems. ALICE C. EVANS, Hygienic Laboratory, Washington, D. C.

Second Session—Thursday a. m.

A Study of the Effect of Calmette's B. C. G. Vaccine on Experimental Animals. MERRILL J. KING, M.D., Director John R. Hegeman Laboratory, Metropolitan Life Insurance Company, Mt. McGregor, N. Y.

2500 Microscopic Slide Precipitation Tests and Wassermann Tests with Same Antigen with Clinical Comparison. BENJAMIN S. KLINE, M.D., S. LITTMAN and M. G. BOWMAN, Mt. Sinai Hospital, Cleveland, O.

Use of Toxoid-Antitoxin Floccules in Diphtheria Immunization. ROY W. PRYER, D.P.H., State Department of Health Laboratories, Lansing, Mich.

Modified Iodine Pentoxide Method for Determination of Carbon Monoxide in Air and Blood. MATHEW J. MARTINEK, Senior Sanitary Chemist, and WILLIAM C. MARTI, Principal Chemist, Department of Health, Chicago, Ill. (*Stereopticon Illustration.*)

Bacteriophage from a Public Health Standpoint. NEWTON W. LARKUM, PH.D., State Department of Health Laboratories, Lansing, Mich.

HEALTH OFFICERS

First Session—Tuesday a. m.

Relation between Ultra-violet Rays and Vital Statistics. ERROL M. COADE, and I. S. FALK, PH.D., Department of Hygiene and Bacteriology, University of Chicago, Chicago, Ill., with the coöperation of HERMAN N. BUNDESEN, M.D., President, American Public Health Association, and ARTHUR J. DEMPSTER, PH.D., University of Chicago, Chicago, Ill.

Ultra-violet Therapy and Public Health Clinics. H. J. GERSTENBERGER, M.D., Babies and Children's Hospital, Cleveland, O. (*Stereopticon Illustration.*)

The Prevention of Air Pollution. ROBERT D. MACLAURIN, PH.D., Department of Public Health and Welfare, Cleveland, O. (*Stereopticon Illustration.*)

Discussion. HARRY L. ROCKWOOD, M.D., Commissioner of Health, Cleveland, O.

The Effect of Atmospheric Pollution in Baltimore upon the Incidence of Solar Ultra-violet Light. J. H. SHRADER, PH.D., President, Research Laboratories, National Dairy Products Corporation, Baltimore, Md., M. H. COBLENTZ, Chief, Division of Chemical Technology and FERDINAND A. KORFF, Chief of Laboratory, Division of Food and Chemistry, Department of Health, Baltimore, Md.

Actinic Measurement of Solar Ultra-violet Light and some Correlations with the Erythema Dose. FRED O. TONNEY, M.D., PAUL P. SOMERS, and WILLIAM C. MARTI, Bureau of Laboratories and Research, Department of Health, Chicago, Ill. (*Stereopticon Illustration.*)

Four Years' Experience with a Consolidated Inspection Service in the Chicago Department of Health. G. KOEHLER, M.D., Assistant Commissioner of Health, and JOHN M. MURPHY, M.D., Chief of Bureau of Inspection Service, Department of Health, Chicago, Ill.

Second Session—Wednesday a. m.

Health Demonstrations. GEORGE C. RUHLAND, M.D., Health Commissioner, Syracuse, N. Y.

Discussion. WALTER H. BROWN, M.D., Palo Alto, Calif., and L. D. BRISTOL, M.D., Executive Secretary, Bellevue-Yorkville Health Demonstration, New York, N. Y.

Practical Points about Active Immunization against Diphtheria and Scarlet Fever. WILLIAM H. PARK, M.D., Director of Laboratories, Department of Health, New York, N. Y., and MAY C. SCHRODER, M.D., Bureau of Laboratories, New York, N. Y.

Active Scarlet Fever Immunization. S. S. WINNER, M.D., Chicago, Ill.

Report of Work of Committee on Administrative Practice. C.-E. A. WINSLOW, DR.P.H., Professor of Public Health, Yale University, New Haven, Conn.

The Care of Communicable Diseases in General Hospitals. DENNETT L. RICHARDSON, M.D., City Hospital, Providence, R. I.

Discussion. W. S. RANKIN, M.D., Duke Endowment, Charlotte, N. C.

The Revision of the Appraisal Form. GEORGE T. PALMER, D.P.H., Director, Division of Research, American Child Health Association, New York, N. Y.

Third Session—Thursday a. m.

RURAL HEALTH PRACTICE

Modern Rural Health Practice. W. K. SHARP, JR., M.D., State Department of Health, Nashville, Tenn.

Discussion. JOHN A. FERRELL, M.D., International Health Board, New York, N. Y., and L. L. LUMSDEN, M.D., Hygienic Laboratory, U. S. Public Health Service, Washington, D. C.

Fundamental Principles of Rural Health Service. WILLIAM S. KEISTER, M.D., Deputy State and County Health Officer, Md.

Discussion. H. S. MUSTARD, M.D., Director Child Health Demonstration, Murfreesboro, Tenn., and FELIX J. UNDERWOOD, M.D., Executive Officer, State Board of Health, Jackson, Miss.

The Problem of Finance. DOUGLAS L. CANNON, M.D., Assistant State Health Officer, Montgomery, Ala.

Discussion. CHARLES O'H. LAUGHINGHOUSE, M.D., State Health Officer, Raleigh, N. C.

The Problem of Trained Personnel. C. N. LEACH, M.D., International Health Division, Rockefeller Foundation, New York, N. Y.

Discussion. JOHN E. MONGER, M.D., State Director of Health, Columbus, O., and N. E. BARNES, M.D., Health Commissioner, Greenville, O.

Measurements of Efficiency and Adequacy. JOSEPH W. MOUNTIN, M.D., U. S. Public Health Service, Nashville, Tenn. (*Stereopticon Illustration.*)

Discussion. W. F. WALKER, D.P.H., American Public Health Association, New York, N. Y., and E. R. SHAFER, M.D., State Department of Health, Columbus, O.

The Strength and the Weaknesses of County Health Organizations. M. E. BARNES, M.D., Health Commissioner, Greenville, O.

VITAL STATISTICS

First Session—Tuesday p. m.

Our National Accident Problem. CHARLES B. SCOTT, Manager, Bureau of Safety, Chicago, Ill.

Discussion. W. THURBER FALES, PH.D., Director, Bureau of Vital Statistics, State Board of Health, Montgomery, Ala.

What We Do Not Know About Accidents. R. L. FORNEY, Statistician, Public Safety Division, National Safety Council, Chicago, Ill.

Discussion. E. S. MACPHAIL, Superintendent, Census and Vital Statistics Branch, Bureau of Statistics, Ottawa, Ont.

What We Are Learning About Accidents from Vital Statistics Records. EARLE G. BROWN, M.D., Secretary State Board of Health, Topeka, Kan., and JAMES E. BAUMAN, Assistant Director, State Department of Health, Columbus, O.

Discussion. HERMAN T. PECK, M.D., General Medical Director, Field Medical Bureau, Department of Health, New York, N. Y.

Second Session—Wednesday a. m.

Section Business

Report of Nominating Committee and Election of Officers.

Report of Committee on Registration Affairs. *Chairman,* WILLIAM H. DAVIS, M.D., U. S. Bureau of the Census, Washington, D. C.

Report of Committee on Forms and Methods of Statistical Practice. *Chairman,* WILLIAM H. DAVIS, M.D., U. S. Bureau of the Census, Washington, D. C.

Report of Committee on Accuracy of Certified Causes of Death and Its Relation to Mortality Statistics and the International List. *Chairman*, HAVEN EMERSON, M.D., Department of Public Health Administration, Columbia University, New York, N. Y.

Report of the Committee to Aid Completion of the Registration Area Before 1930. *Chairman*, LOUIS I. DUBLIN, PH.D., Statistician, Metropolitan Life Insurance Company, New York, N. Y.

Report of Committee on Public Health Climatology. *Chairman*, EDWIN W. KOPF, Assistant Statistician, Metropolitan Life Insurance Company, New York, N. Y.

Report of Committee on Vital Statistics Training. *Chairman*, W. J. V. DEACON, M.D., State Department of Health, Lansing, Mich.

Discussion on Section Betterment.

Third Session—Thursday p. m.

Report of Committee on Proper Allocation of Records. *Chairman*, J. V. DEPORTE, PH.D., Director, Division of Vital Statistics, State Department of Health, Albany, N. Y.

Extent to Which Residence Influences the Recorded Death Rates from Cancer. J. V. DEPORTE, PH.D., Director, Division of Vital Statistics, State Department of Health, Albany, N. Y.

Reallocation of Non-Resident Deaths. WILLIAM C. WELLING, Director, Bureau of Vital Statistics, State Department of Health, Hartford, Conn.

Relation of Climate to Tuberculosis. ROBERT BRUCE WATSON, Industrial Secretary, New Jersey Tuberculosis League, Newark, N. J.

Tuberculosis in Racial Types, with Special Reference to Mexicans. BENJAMIN GOLDBERG, M.D., Secretary, Board of Directors, Municipal Tuberculosis Sanatorium, Chicago, Ill.

Fourth Session—Friday a. m.

Geographic Distribution of Deaths from Diphtheria. DONALD B. ARMSTRONG, M.D., Sc.D., Welfare Department, and GEORGE H. VAN BUREN, Supervisor, Statistical Bureau, Metropolitan Life Insurance Company, New York, N. Y.

Practical Use of Vital Statistics in the Establishment of Neighborhood Health Work in New York City. G. J. DROLET, Consulting Statistician, Bellevue-Yorkville Health Demonstration, New York, N. Y. (*Stereopticon Illustration.*)

Vital Statistics in Insurance. EDWIN W. KOPF, Assistant Statistician, Metropolitan Life Insurance Company, New York, N. Y.

A Comparison of Two Methods of Obtaining Epidemic Cycles. G. E. HARMON, M.D., Western Reserve University, Cleveland, O. (*Stereopticon Illustration.*)

Total Mortality Data in New York City, 1866-1927. HAVEN EMERSON, M.D., Department of Public Health Administration, Columbia University, New York, N. Y.

Discussion. WILLIAM H. GUILFOY, M.D., Health Department, New York, N. Y. (*Stereopticon Illustration.*)

PUBLIC HEALTH ENGINEERING

First Session—Monday p. m.

A County Wide Screening Campaign. HOWARD R. FULLERTON, Director, Division of Sanitary Engineering, Tennessee Department of Public Health, Nashville, Tenn. (*Stereopticon Illustration.*)

Carbon Monoxide Pollution of Air in Chicago. JOEL I. CONNOLLY, Chief, Bureau of Sanitary Engineering, MATHEW J. MARTINEK, Senior Sanitary Chemist, and JOHN J. AEBERLY, JR., Chief, Division of Ventilation, Department of Health, Chicago, Ill. (*Stereopticon Illustration.*)

Body Temperature Regulation and Other Physiological Reactions in Their Relation to Atmospheric Conditions. F. C. HOUGHTON, Director Research Laboratories, American Society of Heating and Ventilating Engineers, Pittsburgh, Pa.

SYMPOSIUM ON SCHOOL ROOM VENTILATION

Reports on Schoolroom Ventilation Studies:

a. *New Haven, Conn.*

LEONARD GREENBURG, PH.D., Yale University, New Haven, Conn.

b. *Cleveland, O.*

LYMAN W. CHILDS, M.D., Supervisor of Health Service, Board of Education, Cleveland, O.

c. *Chicago, Ill., Suburbs*

H. J. SHAUGHNESSY, PH.D., Department of Hygiene, University of Chicago, Chicago, Ill.

d. *Syracuse, N. Y.*

THOMAS J. DUFFIELD, Executive Secretary, New York State Commission on Ventilation, New York, N. Y.

Discussion. A. C. WILLARD, President American Society of Heating and Ventilating Engineers, Urbana, Ill., and C.-E. A. WINSLOW, DR.P.H., Yale University, New Haven, Conn.

Discussion.

Second Session—Tuesday p. m.

Report of Committee on Milk Supply. *Chairman,* H. A. WHITTAKER, Director, Division of Sanitation, Minnesota Department of Health, Minneapolis, Minn.

North Carolina's Milk Control Program. H. E. MILLER, Director, Bureau of Sanitary Engineering, State Board of Health, Raleigh, N. C.

Discussion. 10 minutes.

SYMPOSIUM ON STERILIZATION OF MILK CONTAINERS AND EQUIPMENT

Milking Machines and Milk Plant Equipment. M. J. PRUCHA, Professor of Dairy Products, University of Illinois, Urbana, Ill.

Milk Utensils. WILLIAM E. REID, Associate Professor of Dairy Manufactures, University of Missouri, Columbia, Mo.

Milk Bottles. LEWIS SHERE and GERALD L. HIEFT, Department of Health, Chicago, Ill.

SYMPOSIUM ON SHELLFISH SANITATION

The Federal Shellfish Control Program. R. E. TARBETT, Sanitary Engineer, U. S. Public Health Service, Washington, D. C.

Discussion. STEPHEN DEM. GAGE, Sanitary Engineer, State Board of Health, Providence, R. I., and ABEL WOLMAN, Chief Engineer, State Board of Health, Baltimore, Md.

Public Health Engineering Standards and Shellfish Sanitation. WILLIAM F. WELLS, Biological Engineer, North Atlantic Oyster Farms, Inc., West Sayville, L. I., N. Y.

Discussion. GEORGE W. FULLER, Consulting Engineer, Fuller and McClinck, New York, N. Y., and CARL SPEER, JR., Sanitary Engineer, Chicago, Ill.

Discussion.

*Dinner Session—Tuesday**Third Session—Wednesday a. m.*

SYMPOSIUM ON FINANCING WATER SUPPLY AND SEWERAGE PROJECTS

Financing Sewerage Improvements. LANGDON PEARSE, Sanitary Engineer, Chicago Sanitary District, Chicago, Ill.

Discussion. HARRY F. FERGUSON, Chief Engineer, State Department of Health, Springfield, Ill., and J. RALPH VAN DUYNE, Chief Engineer, Passaic Valley Sewerage Commission, Newark, N. J.

Financing Water Supply Improvements. WILLIAM H. DITTOE, Chief Engineer, Mahoning Valley Sanitary District, Youngstown, O.

Discussion. W. W. BRUSH, Chief Engineer, Bureau of Water, New York, N. Y., and A. K. WARREN, Chief Engineer, Sanitation District of Los Angeles County, Los Angeles, Calif.

Financing for Water Supply and Sewerage Improvements. GEORGE G. EARL, General Superintendent and Chief Engineer, Sewerage and Water Board, New Orleans, La.

Discussion. J. CLARK KEITH, Chief Engineer, Essex Border Utilities Commission, Windsor, Ont.

Watershed Sanitation. E. SHERMAN CHASE, Metcalf and Eddy, Boston, Mass.

*Luncheon Session—Wednesday**Fourth Session—Thursday a. m.*

SYMPOSIUM ON THE DISPOSAL OF PHENOL WASTES

Results Obtained in Phenol Waste Disposal under the Ohio River Basin Interstate Stream Conservation Agreement. F. HOLMAN WARING, Chief Engineer, State Department of Health, Columbus, O.

Discussion. WILLIAM L. STEVENSON, Chief Engineer, State Department of Health, Harrisburg, Pa., ELLIS S. TISDALE, Director, Division of Sanitary Engineering, State Department of Health, Charleston, W. Va., and C. A. HOLMQUIST, Director, Division of Sanitation, State Department of Health, Albany, N. Y.

Industry's Problem in the Disposal of Phenol Wastes. F. F. MARQUARD, Assistant General Manager, Carnegie Steel Company, Clairton, Pa., F. W. SPERR, JR., Director of Research, Koppers Company, Mellon

- Institute, Pittsburgh, Pa., and C. L. WAGGONER, Superintendent, Coke Oven Plant, By-Products Coke Corporation, Chicago, Ill.
- Biochemical Oxidation of Phenolic Wastes. FLOYD W. MOHLMAN, PH.D., Chief Chemist, Chicago Sanitary District, Chicago, Ill.
- Discussion.* WILLIAM A. RYAN, Chemist, Department of Public Works, Rochester, N. Y.

INDUSTRIAL HYGIENE

First Session—Tuesday p. m.

- Industrial Fatigue (Including Report of Committee for the Study of Industrial Fatigue). *Chairman*, EUGENE LYMAN FISK, M.D., Medical Director, Life Extension Institute, New York, N. Y.
- Mortality Trends in the Industrial Population. LOUIS I. DUBLIN, PH.D., Statistician, Metropolitan Life Insurance Company, New York, N. Y.
- The Outlook for Occupational Mortality Statistics. LEON E. TRUESDELL, Chief Statistician for Population, U. S. Bureau of the Census, Washington, D. C.
- Discussion.* DEAN K. BRUNDAGE, U. S. Public Health Service, Washington, D. C., and EUGENE LYMAN FISK, M.D., Medical Director, Life Extension Institute, New York, N. Y.
- Report of Committee on Status of Silicosis. R. R. SAYERS, M.D., Chief Surgeon, U. S. Bureau of Mines, Washington, D.C.

Luncheon Session—Wednesday

- Report of Committee on Occupational Morbidity Statistics. WADE WRIGHT, M.D., Assistant Medical Director, Policy Holders Service Bureau, Metropolitan Life Insurance Company, New York, N. Y.
- Round Table Discussion, Industrial Fatigue.* (Also impressions of Fifth International Medical Congress on Industrial Accidents and Occupational Diseases, Budapest, September 2-8, and The Royal Institute of Public Health, Dublin, August 15-20, by EMERY R. HAYHURST, M.D., and others.)
- The Possible Relationship of Mutual Benefit Associations to the Health of Employees.

Second Session—Thursday p. m.

- Mobilizing Mutual Benefit Associations to Include Health Activities. MAGNUS W. ALEXANDER, President, National Industrial Conference Board, New York, N. Y.
- Discussion.* MEYER BLOOMFIELD, Consultant on Industrial Relations, New York, N. Y., WILLIAM A. SAWYER, M.D., Medical Director, Eastman Kodak Company, Rochester, N. Y., E. B. HUNT, Superintendent, Pennsylvania Railroad Voluntary Relief Department, Philadelphia, Pa., and VOLNEY S. CHENEY, M.D., Medical Director, Armour and Company, Chicago, Ill.
- Report of the Committee on the Status of Lead Poisoning in the United States for the Year Ending June 30, 1928. CAREY P. MCCORD, M.D., and DOROTHY K. MINSTER, Industrial Health Conserv-

ancy Laboratories, and ROBERT KEHOE, M.D., University of Cincinnati, Cincinnati, O.

Report of Committee on Standard Practices in the Compensation of Occupational Diseases. A. J. LANZA, M.D., Assistant Medical Director, Metropolitan Life Insurance Company, New York, N. Y.

Report of Committee on Volatile Solvents. ALICE HAMILTON, M.D., Harvard School of Public Health, Boston, Mass.

Report of Committee on Skin Irritants. HENRY FIELD SMYTH, M.D., DR.P.H., Laboratory of Hygiene, University of Pennsylvania, Philadelphia, Pa.

Third Session—Friday a. m.

How Employe Magazines Can be Used to Promote Health. MEYER BLOOMFIELD, Consultant on Industrial Relations, New York, N. Y.

Extension of Industrial Hygiene by Tuberculosis Associations in the United States. BERNARD S. COLEMAN, Executive Secretary, Hudson County Tuberculosis League, Jersey City, N. J.

The Tuberculous Worker and His Placement in Industry. C. W. BERGQUIST, President, Chicago Tuberculosis Institute, Chicago, Ill.

Discussion. WADE WRIGHT, M.D., Assistant Medical Director, Policy Holders Service Bureau, Metropolitan Life Insurance Company, New York, N. Y., and EMERY R. HAYHURST, M.D., College of Medicine, Ohio State University, Columbus, O.

Health Education in an Industrial Plant. JOHN B. GIBSON, Director of Safety and Health, Western Electric Company, Chicago, Ill.

Public Health and Medical Work in a Large Coal Company. DANIEL J. KINDEL, M.D., Medical Director, The Consolidation Coal Company, Fairmont, W. Va. (*Stereopticon Illustration.*)

Discussion. LLOYD NOLAND, M.D., Chief Surgeon, Tennessee Coal, Iron and Railroad Company, Birmingham, Ala.

FOOD, DRUGS AND NUTRITION

First Session—Wednesday a. m.

Report of the Committee on Beverages. T. J. KING, Supervising Food Inspector, Department of Health, Chicago, Ill.

Report of the Committee on Fruits, Vegetables and their Products. *Chairman,* H. M. LOOMIS, U. S. Public Health Service, Washington, D. C.

Report of the Committee on Cereals and their Products. *Chairman,* F. C. BLANCK, PH.D., Bureau of Chemistry and Soils, Washington, D. C.

Report of the Committee on Meat, Fish and Shellfish. *Chairman,* CARL R. FELLERS, PH.D., Massachusetts Agricultural College, Amherst, Mass.

Report of the Committee on Nutritional Problems. *Chairman,* PROFESSOR HENRY C. SHERMAN, Department of Chemistry, Columbia University, New York, N. Y.

What We Should Strive for in Food Advertising. PROFESSOR E. V. MCCOLLUM, Johns Hopkins School of Hygiene and Public Health, Baltimore, Md.

Second Session—Thursday p. m.

- Health Significance of Small Amounts of Metals.** J. S. MCHARGUE.
Some Aspects of Intestinal Bacteriology in Relation to Health.
PROFESSOR LEO F. RETTGER, New Haven, Conn.
- Evaporated Milk and Its Relation to Public Health.** FRANK E. RICE,
Executive Secretary, Evaporated Milk Association, Chicago, Ill.
- Ice Cream Control.** FREDERICK W. FABIAN, Associate Professor of Bacteriology and Hygiene, Michigan State College, East Lansing, Mich.
- The Use of Ultra-violet Transmitting Glass.** WALTER H. EDDY,
PH.D., Professor of Physiological Chemistry, Teachers College, Columbia University, New York, N. Y. (*Stereopticon Illustration.*)
- Certificates of Approval for Food Establishments Complying with Ordinances.** JAMES P. KILCOURSE, LL.B., Chief, Bureau of Food Inspection, Department of Health, Chicago, Ill.

CHILD HYGIENE

(These Sessions are Joint with the American Child Health Association.)

First Session—Wednesday a. m.

SCHOOL MEDICAL AND NURSING SERVICE

- Sickness and Absence Records in the School Health Program.**
Methods and Procedures and the Values Resulting. O. B. NESBIT,
M.D., Director of Medical Inspection, Public Schools, Gary, Ind.
- The Place of Sickness Records in the School Health Program.**
SELWYN D. COLLINS, PH.D., Associate Statistician, U. S. Public Health Service, Washington, D. C. (*Stereopticon Illustration.*)
- Discussion.** HAVEN EMERSON, M.D., Department of Public Health Administration, Columbia University, New York, N. Y.
- Business of Child Hygiene Section*
- Physical Determinants of Individual Differences in Weight.**
RAYMOND FRANZEN, PH.D., Research Director, School Health Study, American Child Health Association, New York, N. Y.
- Discussion*
- Four-Year Child Health Study of an American Community, A Report of Progress of an Investigation on Grosse Ile, Mich.**
CHARLES A. WILSON, M.D., Merrill-Palmer School, Detroit, Mich. (*Stereopticon Illustration.*)
- Discussion.** Opened by E. V. MCCOLLUM, PH.D., Professor of Chemical Hygiene, School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md.

Second Session—Wednesday p. m.

- How Can We Improve Our Procedures for Correction of Physical Defects?** WALTER S. CORNELL, M.D., Director, Medical Inspection of Public Schools, Philadelphia, Pa.
- The Nurse's Activities to Obtain the Correction of Physical Defects.**
ANN DICKIE BOYD, R.N., Supervisor of Nurses, Public Schools, Denver, Colo.

Discussion. FRED MOORE, M.D., Director Health Department of Public Schools, Board of Education, Des Moines, Ia.

What is the Teacher's Part in the Program to Get Physical Defects Corrected? GEORGIE B. COLLINS, Assistant Editor of Health Films, Eastman Teaching Films, Inc., formerly Director of Health Education, Public Schools, Malden, Mass.

Discussion

School Medical Service in a Continuation School. E. H. LEWINSKI-CORWIN, PH.D., Executive Secretary, Public Health Relations Committee, Academy of Medicine, New York, N. Y.

Discussion. EMMA MCKAY APPEL, M.D., Medical Examiner, Vocational Guidance Bureau, Board of Education, Chicago, Ill.

A Practical Method of Recording Physical Defects and Their Correction. LEON BANOV, M.D., Health Officer, Charleston, S. C.

Third Session—Thursday a. m.

DENTAL HYGIENE

What Habit, Attitude and Knowledge Objectives Should be Sought at Various Age Levels? Discussion Based on Mouth Hygiene Materials in *Health Behavior*, by Wood and Lerrigo, published by The Public School Publishing Company, Bloomington, Ill. HARRY S. THOMSON, S.D., M.D., Field Secretary, Canadian Dental Hygiene Council, Toronto, Ont.

Discussion.

Discussion on Dental Health Education Materials Designed for School Use Collected with the Coöperation of the American Dental Association. Criticisms and Suggestions from Point of View of Subject Matter. WILLIAM R. DAVIS, D.D.S., Director, Bureau of Mouth Hygiene, State Department of Health, Lansing, Mich.

Discussion

Dental Health Education Materials from Point of View of Educational Presentation and Usefulness. MARION O. LERRIGO, PH.D., New York, N. Y.

Discussion.

Summary and Comments. GUY S. MILLBURY, D.D.S., Dean, College of Dentistry, University of California, San Francisco, Calif.

PUBLIC HEALTH EDUCATION

Luncheon Session—Monday

High Spots in 1927-1928—New Ideas and successful methods.

Luncheon Session—Tuesday

Program for Health Education Training in Teachers' Colleges. MARY L. HAHN, State Department of Health, Springfield, Ill.

Dinner Session—Tuesday

Business Conference of Public Health Education Section (Closed Session)

Luncheon Session—Wednesday

Why Some of the Exhibits Are Good—Constructive discussion of the scientific exhibits

First Session—Wednesday p. m.

STEPS IN PLANNING A HEALTH EDUCATION AND PUBLICITY

PROGRAM—PART I

An Introduction to Planning. MARY SWAIN ROUTZAHN, Russell Sage Foundation, New York, N. Y.

Objectives of Publicity—On what basis are they selected? HOWARD W. GREEN, Secretary, Cleveland Health Council, Cleveland, O.

Audiences—How to select and classify them? MARJORIE DELEVAN, Bureau of Education, Michigan Department of Health, Lansing, Mich.

The Facts—How decide what is to be told? C.-E. A. WINSLOW, DR.P.H., Professor of Public Health, Yale University, New Haven, Conn.

Second Session—Thursday a. m.

STEPS IN PLANNING A HEALTH EDUCATION AND PUBLICITY

PROGRAM—PART II

The Approach—How decide on the motives for conduct to which an appeal will be made? FRANKLIN FEARING, Professor of Psychology, Northwestern University, Evanston, Ill.

The Methods—On what basis should they be selected? KATHRYNE M. RADEBAUGH, Executive Secretary, Hennepin County Tuberculosis Association, Minneapolis, Minn.

Examples of Health Education and Publicity Programs—A review of current practice. IAGO GALDSTON, M.D., Bureau of Health Education, New York Tuberculosis and Health Association, New York, N. Y. (Mimeographed copies of sample programs available in advance at Information Desk and Education and Publicity Headquarters)

Luncheon Session—Thursday

Diphtheria Campaigning—What is new? What is difficult? MARIE F. KIRWAN, Tuberculosis and Public Health Committee, State Charities Aid Association, New York, N. Y.

PUBLIC HEALTH NURSING

First Session—Monday p. m.

Staff Education—Means By Which a City Combined Official and Voluntary Nursing Services. VIRGINIA GIBBES MCPHEETERS, R.N., Director of Public Health Nursing, Coöperative Nursing Association, Charlotte, N. C.

Discussion.

The Health Officer's Responsibility for Staff Education.

The Educational Directors Responsibility. JOSEPHINE F. GOLDSMITH, R.N., Director of Nurse Education, Department of Health, Syracuse, N. Y.

Common Interest Problems of State Directors of Public Health Nursing. EVA F. MACDOUGALL, R.N., State Board of Health, Indianapolis, Ind.

Discussion. ZOE MCCALED, R.N., Director of Public Health Nursing, State Board of Health, Columbus, O., and PEARL MCIVER, R.N., Director of Public Health Nursing, State Board of Health, Jefferson City, Mo.

Luncheon Session—Wednesday

Second Session—Thursday p. m.

Section Business.

Public Health Nursing Report of Editorial Committee. MIRIAM AMES, R.N., John Hancock Life Insurance Company, Boston, Mass.

Report of Advisory Committee on Public Health Nursing. SOPHIE C. NELSON, R.N., John Hancock Life Insurance Company, Boston, Mass.

Report of Nominating Committee. ELIZABETH G. FOX, R.N., American Red Cross, Washington, D. C.

MEETINGS OF OTHER ORGANIZATIONS

The American Child Health Association will hold sessions jointly with the Child Hygiene and other Sections of the American Public Health Association and in addition will hold the following sessions:

HEALTH EDUCATION DIVISION OF THE AMERICAN CHILD HEALTH ASSOCIATION

Tuesday a. m.

Curriculum Construction for Health Education—A Continuing Coöperative Enterprise.

Discussion. CLAIR E. TURNER, DR.P.H., Professor, Department of Biology and Public Health, Massachusetts Institute of Technology, Cambridge, Mass.

Classroom Situations as Teaching Opportunities for Health Instruction. FLETA MCWHORTER, Supervisor of Health Education, Jefferson County Boards of Health and Education, Birmingham, Ala.

Science as a Channel for Health Instruction in Elementary Schools. ELIZABETH AMES, Director, Science and Arts, Public Schools, Gary, Ind.

AMERICAN CHILD HEALTH ASSOCIATION

Luncheon Session—Tuesday

Dinner Session—Tuesday

Dinner and Annual Business Meeting of the American Child Health Association.

ANNUAL CONFERENCE OF ILLINOIS HEALTH OFFICERS and

PUBLIC HEALTH NURSES

First Session—Monday a. m.

Greetings. ISAAC D. RAWLINGS, M.D., Director, State Department of Public Health, Springfield, Ill., *Chairman.*

World Health Intelligence. FRANK C. BOUDREAU, M.D., Health Section, League of Nations, Geneva, Switzerland.

A State Cancer Problem. GEORGE H. BIGELOW, M.D., Commissioner of Public Health, Boston, Mass.

The Year's Biggest Problem. ARNOLD H. KEGEL, M.D., Commissioner of Health, Chicago, Ill., JOHN W. H. POLLARD, M.D., Commissioner of Health, Evanston, Ill., and W. H. NEWCOMB, M.D., Health Officer, Jacksonville and Morgan County, Ill.

Second Session—Monday p. m.

A County Health Department at Work. J. L. POMEROY, M.D., Health Officer, Los Angeles County, Los Angeles, Calif.

The Public Health Nurse. EUNICE H. DYKE, R.N., Director of Public Health Nursing, Toronto, Ont.

The Year's Biggest Problem. N. O. GUNDERSON, M.D., Commissioner of Health, Rockford, Ill., HOWARD A. ORVIS, M.D., Health Officer, Winnetka, Ill., and W. C. DIXON, M.D., Health Officer, Danville, Ill.

Third Session—Tuesday a. m.

World Health Service. C.-E. A. WINSLOW, DR.P.H., School of Medicine, Yale University, New Haven, Conn.

Health Service in England. GEORGE FREDERICK BUCHAN, M.D., President, Society of Medical Officers of Health, England.

The Year's Biggest Problem. GEORGE W. HAAN, M.D., Health Commissioner, Aurora, Ill., GEORGE D. HEATH, M.D., Health Director, Bloomington, Ill., and J. J. HOOD, M.D., Health Officer, Cicero, Ill.

THE WOMEN'S FOUNDATION FOR HEALTH

Wednesday Evening

A HEALTH-POSITIVE SYMPOSIUM

Chairman, LENNA L. MEANES, M.D., Medical Director, Women's Foundation for Health, New York, N. Y.

Health Promotion versus Disease Prevention. COURTENAY DINWIDIE, Director, Child Health Demonstration Committee, New York, N. Y.

The Place of the Director of Physical Education in the Field of Positive Health. EDNA MUHLFELD, Assistant Director, Department of Physical Education, Women's Foundation for Health, New York, N. Y.

Work and Play. LILLIAN M. GILBRETH, Ph.D., Montclair, N. J.

THE AMERICAN SOCIAL HYGIENE ASSOCIATION

Monday p. m.

THE PROGRAM FOR SYPHILIS RESEARCH IN THE UNITED STATES

Chairman, WILLIAM F. SNOW, M.D., General Director, American Social Hygiene Association, New York, N. Y.

Clinical Research. JOHN H. STOKES, M.D., Professor, Department of Dermatology and Syphilology, School of Medicine, University of Pennsylvania, Philadelphia, Pa.

Laboratory Research. WADE BROWN, M.D., Rockefeller Institute for Medical Research, New York, N. Y.

Statistical and Public Health Research. THOMAS PARRAN, M.D., Assistant Surgeon General U. S. Public Health Service, Washington, D. C.

General Session—Tuesday Evening

SOCIAL HYGIENE—ITS ACHIEVEMENTS AND ITS NEEDS

Chairman, C.-E. A. WINSLOW, DR.P.H., School of Medicine, Yale University, New Haven, Conn.

Speakers—REV. ALPHONSE M. SCHWITALLA, St. Louis University, School of Medicine, St. Louis, Mo., BASCOM JOHNSON, Director, Division of Legal and Protective Measures, American Social Hygiene Association, New York, N. Y., SOPHIE C. NELSON, R.N., John Hancock Life Insurance Company, Boston, Mass., and PROFESSOR MAURICE A. BIGELOW, Teachers College, Columbia University, New York, N. Y.

ILLINOIS SOCIAL HYGIENE ASSOCIATION

One-day Institute

Wednesday morning

Venereal Disease Clinic Management:

- a. College clinics
- b. Free clinics
- c. Pay clinics

Discussion.

Luncheon

Wednesday afternoon

Sex Education.

Papers and conferences

Dinner

Wednesday evening

Problems of Prostitution and How We are Meeting Them.

(It is hoped that several trips may be made to various Chicago Clinics which are interested in the work of Social Hygiene.)

THE FOLLOWING ORGANIZATIONS WILL HOLD MEETINGS:

Association of Women in Public Health

Alumni of the University of Michigan and of other universities

Delta Omega

Conference of State Sanitary Engineers

State Laboratory Directors Association

American Association of School Physicians

Visiting Nurse Association of Chicago has arranged a banquet for nurses.

International Association of Dairy and Milk Inspectors will hold their annual meeting in Chicago, October 11-13.

ASSOCIATION NEWS

ANNUAL MEETING INFORMATION

CHICAGO LOCAL COMMITTEE

EXECUTIVE COMMITTEE

Louis E. Schmidt, M.D., *Chairman*
Arthur E. Gorman, *Secretary*
Isaac A. Abt, M.D.
Volney S. Cheney, M.D.
Thomas R. Crowder, M.D.

William A. Evans, M.D.
Edwin O. Jordan, Ph.D.
Arnold H. Kegel, M.D.
Jacob M. Loeb.
Isaac D. Rawlings, M.D.

SUB-COMMITTEE CHAIRMEN

Louis E. Schmidt, M.D., Chicago Executive Committee
Jacob M. Loeb, Chicago Citizens' Committee
Volney S. Cheney, M.D., Finance Committee
William A. Evans, M.D., Reception Committee
Arthur E. Gorman, Publicity Committee
Arnold H. Kegel, M.D., Registration and Meeting Rooms Committee

Thomas R. Crowder, M.D., Inspection Trips Committee
Paul Hansen, Entertainment Committee
Mrs. Herman N. Bundesen, Ladies' Entertainment Committee
Samuel B. Plummer, M.D., Traveling Health Exhibits Committee
Isaac A. Abt, M.D., Membership Committee

FOR THE AMERICAN CHILD HEALTH ASSOCIATION

Mary E. Murphy
Sara B. Place, R.N.
Clifford G. Grulec, M.D.

TRIPS OF GENERAL INTEREST, SPECIFIC INFORMATION AND PLEASURE

Chicago offers visitors unusual opportunities to investigate practical public health programs, and elaborate plans have been made by the Chicago Local Committee for the entertainment of delegates and guests at the 57th Annual Meeting of the Association in Chicago next month.

In arranging these trips the Local Committee has scheduled some that will be of general interest to those attending the meeting and it has planned a series of trips of specific interest to the several groups of the American Public Health Association, the American Child Health Association and other organizations to be represented.

Among the 81 trips planned, 18 are scheduled trips, 7 of general interest,

and 11 for the special groups, including laboratory technicians, nutritionists, public health nurses, child hygienists, welfare workers, social hygienists, industrial hygienists, public health engineers, food and drugs specialists, rural sanitarians, and vital statisticians.

All scheduled trips will be arranged at a time convenient for those most interested.

Listed among the scheduled trips are visits to hospitals and public institutions including Cook County Hospital, the Illinois Research Hospital, Municipal Contagious Disease Hospital, Daily News Sanitarium for Children and Mothers, Children's Memorial Hospital, Municipal Tuberculosis Sanitarium, the Medical Schools of Chicago University and Northwestern University; to dairy product plants including the Wanzer

Sunlight Milk, People's Ice Cream Company, the Bowman Dairy Company, the Borden Dairy Company and Christiansen Brothers; research laboratories of the Fire Underwriters, University of Chicago, and the City of Chicago Experimental Water Filtration Laboratory; Hull House Settlement, Columbus Park Infant Welfare Station, nursery schools, the Spaulding School for Convalescent Care of Poliomyelitis, prenatal and pre-school clinics, Visiting Nurses Association, Sears Roebuck Company, Institute for Juvenile Research, Juvenile Court and Juvenile Detention Home of Cook County, venereal disease clinic of the Chicago Department of Health, International Harvester Company, Pullman Company, ventilation plant of Chicago Theater, Illinois Steel Company, Union Stock Yards, Chicago Experimental Water Filtration Plant, 68th Street. Pumping Station and Chlorination Plant, Calumet Sewage Treatment Plant of Chicago Sanitary District, Chicago Produce Market, Chicago Cold Storage Warehouse, Cook County Dental Clinic, Des-Plaines School of Health, Camp Remberg, and the statistical departments of the City of Chicago, Department of Health, Illinois Bell Telephone Company.

In addition to these scheduled trips the Local Committee has listed 63 places of general and special interest. Information regarding these trips will be printed in the final program and in the *Daily Bulletin* to be issued throughout the week of the meeting.

NOTE: A description of Hull House as a Health Center, The Visiting Nurse Association of Chicago and The Infant Welfare Society of Chicago will be described in the September issue of the *Child Health Bulletin*, published by the American Child Health Association.

VARIETY OF ENTERTAINMENT FOR WOMEN GUESTS

Women delegates and guests to the meeting will be guests of the Local Com-

mittee on trips to the Field Museum of Natural History and the Chicago Art Institute to be conducted by a special guide and lecturer, and on sight-seeing trips around Chicago stopping at places of interest enroute. The Chicago Park system affords several hours' delightful drive and this will be featured in the women's entertainment program.

They will be entertained at a tea at the Ida Noyes Hall, University of Chicago, which is considered one of the most beautiful and artistic buildings for college women's activities in the country. Another tea has been arranged by the Chicago Nurses' Association, and luncheons in the Marine Dining Room of the Edgewater Beach Hotel, at the Illinois Women's Athletic Club, the Medical Arts Club, in the Red Lacquer Room of the Palmer House, and still another in the Wedgewood Room of the store of Marshall Field and Company.

The women will have an opportunity to visit Chicago's leading department stores and specialty shops and attend a Fashion Show and linen demonstration arranged especially for them through the courtesy of Marshall Field and Company. There will be a bridge party one afternoon during the week at Hotel Stevens and also several theater parties.

AMERICAN ASSOCIATION OF SCHOOL PHYSICIANS TO MEET

The American Association of School Physicians will hold its meetings at Hotel Stevens, Chicago, Ill., October 15 at 9:30 a. m., 2:00 and 6:00 p. m. The morning and afternoon sessions will be held in private Dining Room No. 1, and the evening session which is to be a dinner meeting will be held in West Ball Room and Assembly. An invitation is extended to all school physicians to attend the meetings and participate in the program.

HOTELS

A number of the Chicago hotels are listed, with their rates. This is for the convenience of delegates who desire to plan ahead. The map on page 1162 shows the location of these hotels together with many of the places of interest to vistiors. Headquarters for the Annual Meeting will be the Hotel Stevens, shown as number 1 on the map.

Applications for hotel reservations should be made directly to the hotels. A blank is supplied here for your convenience.

SUGGESTED AMENDMENT TO THE CONSTITUTION

At the recommendation of the Committee on Constitution, the following amendment will be offered for adoption at the Chicago meeting:

ARTICLE III, Section A, Part 2, at the end of the second paragraph after the word "elected" add the words "by the Governing Council."

HOTEL	HOTEL RATES			
	SINGLE		DOUBLE	
	With Bath	Without Bath	With Bath	Without Bath
Auditorium	\$3.40- 6.00	\$2.00-3.00	\$5.00- 8.00	\$3.00-5.00
Blackstone	5.00-14.00	4.00-5.00	6.00-16.00	5.00
Congress	4.00-10.00	3.00-5.00	6.00-12.00	4.00-6.00
Drake	5.00-10.00		6.00-14.00	
Edgewater Beach	4.00- 6.00		6.00- 8.00	
LaSalle	3.50- 6.00	2.50-3.50	5.00- 8.00	4.00-5.00
Morrison	2.50-10.00		5.00-12.00	
New Bismarck	3.50- 6.00	2.50	5.00-10.00	4.00
Palmer House	4.00-10.00		7.00-12.00	
Sherman	3.00- 7.00	2.50-3.00	4.00- 8.00	4.00-5.00
Stevens	3.00-10.00		4.50-10.00	

(Cut off on this line)

HOTEL RESERVATION BLANK

To (Name of Hotel)

Please reserve for me rooms for persons for the A. P. H. A. Meeting. (Cross [X] is placed after my preference.)

Single room Double room

Maximum rate per day for room \$ Minimum rate per day for room \$

I expect to arrive Oct. If date of arrival is changed I will notify you at least 24 hours in advance.

Please acknowledge this reservation.

Name

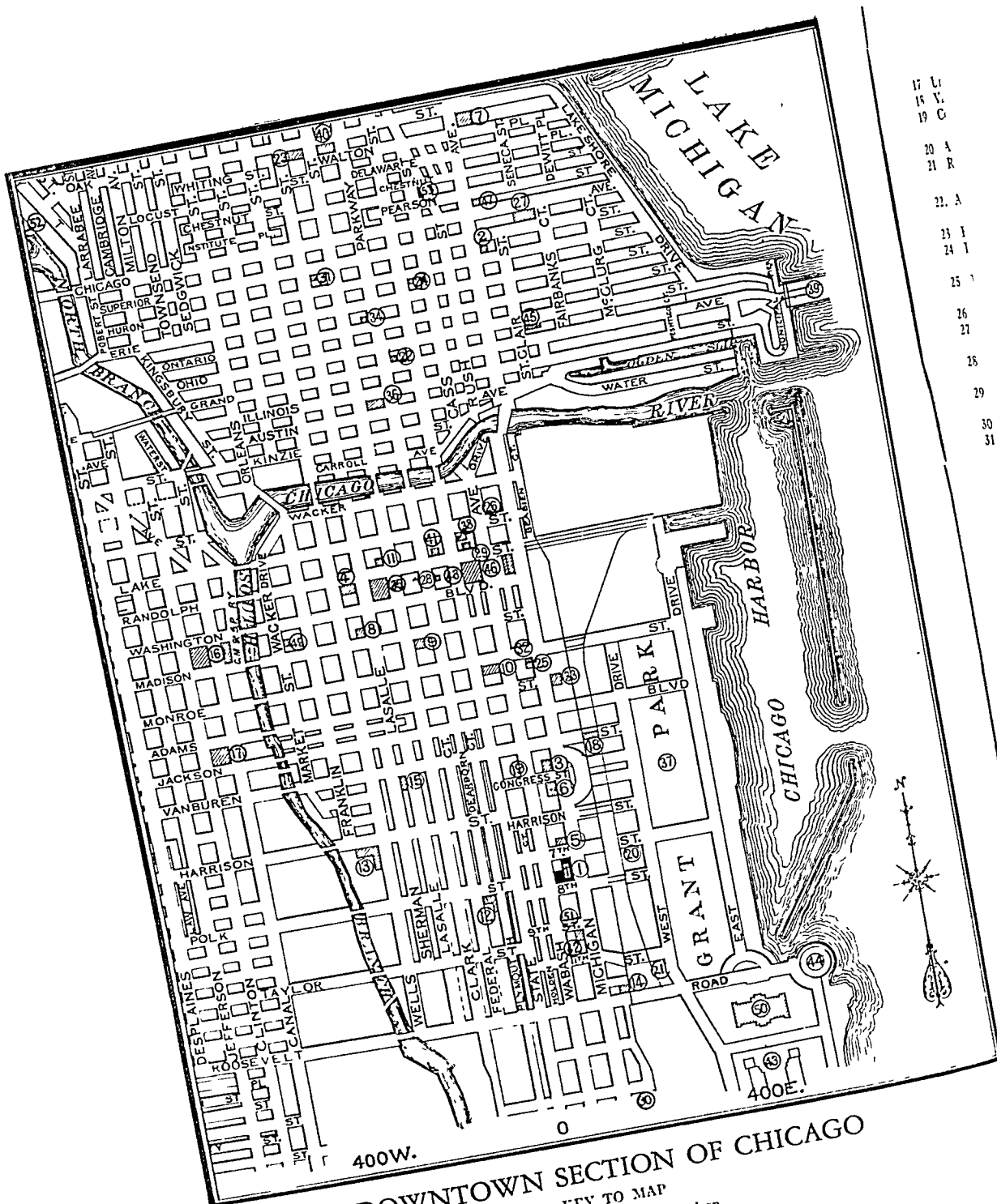
Street Address

City State

If this blank is addressed to the Hotel Stevens please check one of the following:

1. If accommodations are unavailable, please make reservation for me at one of the following hotels.

2. If accommodations are unavailable, please advise me.



400W. 0 400E. DOWNTOWN SECTION OF CHICAGO

KEY TO MAP

- Hotels*
1. Stevens (Headquarters)
 2. Allerton Club
 3. Auditorium
 4. Bismarck
 5. Blackstone
 6. Congress
 7. Drake
 8. La Salle

- Railroad & L. Stations*
9. Morrison
 10. Palmer House
 11. Sherman
 12. Dearborn St.
 13. Grand Central (B & O)
 14. Illinois Central
 15. La Salle St.
 16. Northwestern

17. L
18. V
19. C

20. A
21. R

22. A

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Railroads and L. Stations (cont.)

- 17 Union
- 18 Van Buren St (1 C Suburban)
19. Congress 'L'
- Traveling Health Exhibits*
- 20 Automobile exhibits
21. Railroad exhibits
- Medical & Welfare Institutions*
22. American Medical Assn Headquarters 535 N Dearborn St
- 23 Henrotin Hospital 939 N La Salle St
- 24 Illinois Social Hygiene League Headquarters, 9 L. Huron St
- 25 Illinois State Assn of Graduate Nurses, 116 S Michigan Ave
- 26 Infant Welfare Socy 207 N Wabash Ave
- 27 Northwestern University School of Medicine, Chicago Ave
- 28 Public Health Institute (men), 159 N Dearborn St
- 29 Public Health Institute (women) 72 L Randolph St
- 30 St Luke's Hospital, 1139 So Michigan Ave
- 31 St Vincent's Maternity Hospital, 721 N La Salle St

- 32 Visiting Nurses Assn Headquarters, 104 S Michigan Ave

Other Points of Interest

- 33 Art Institute
- 34 Chicago Historical Assn
- 35 City-County Bldg
- 36 Criminal Court and Jail
- 37 Buckingham Memorial Fountain
- 38 Chicago Theatre
- 39 Municipal Pier
- 40 Newberry Library
- 41 Oriental Theatre
- 42 Sanitary District of Chicago Headquarters
- 43 Soldiers Field
- 44 Shedd Aquarium
- 45 Underwriters Laboratory
- 46 Chicago Public Library
- 47 Chicago Ave Pumping Station
- 48 Marshall Field & Co
- 49 Iroquois Hospital, 23 N Market St
- 50 Field Museum
51. Sanitary District of Chicago Laboratories 845 South Wabash Ave
- 52 Chicago Garbage Incinerator
- 53 Illinois Women's Athletic Assn

REDUCED RAILROAD RATES

Persons attending the 57th Annual Meeting of the Association and related meetings in Chicago, October 15-19, will be granted a rate of one and one-half times a single fare by the railroads from the starting point to Chicago and return.

To obtain the reduced rate it is necessary to obtain from the ticket agent a reduced fare certificate when purchasing your ticket for Chicago. This reduction is available to all delegates and members of their families attending the Annual Meeting of the American Public Health Association, the American Child Health Association, the American Social Hygiene Association, the International Association of Dairy and Milk Inspectors and other meetings being held at the same time and place.

Ask for a certificate for the meeting of the A.P.H.A. and related societies. This certificate when validated by the Executive Secretary of the A.P.H.A. at the Chicago meeting will entitle the purchaser to a return ticket at half fare.

Detailed information regarding railroad rates and transportation will be sent to members of the Association in a letter from the Executive Secretary the first week in September.

RAILROAD RATES FROM VARIOUS CENTERS
TO CHICAGO

	Regular Rate	Special Rate		
	One Way	Round Trip	Lower Berth	Upper Berth
Atlanta, Ga.	\$26.72	\$40.08	\$8.25	\$6.60
Baltimore, Md.	27.78	41.67	8.25	6.60
Boston, Mass.	36.73	55.10	10.13	8.10
Buffalo, N. Y.	18.81	28.22	5.63	4.50
Cincinnati, O.	10.26	15.39	3.75	3.00
Cleveland, O. (via Orrville)	12.71	19.07	3.75	3.00
Dallas, Tex.	34.36	51.54	10.50	8.40
Denver, Colo.	37.28	55.92	10.88	8.70
Detroit, Mich.	9.81	14.72	3.75	3.00
Indianapolis, Ind.	6.62	9.93	3.75	3.00
Jacksonville, Fla.	38.95	58.43	12.00	9.60
Kansas City, Mo.	16.54	24.81	4.50	3.60
Los Angeles, Calif.	79.84	119.76	23.63	18.90
Louisville, Ky.	10.80	16.20	3.75	3.00
Memphis, Tenn.	19.58	29.37	5.63	4.50
Minneapolis, Minn.	14.66	21.99	3.75	3.00
Nashville, Tenn.	16.32	24.48	4.50	3.60
New Orleans, La.	33.76	50.64	10.13	8.10
New York, N. Y.	32.70	49.05	9.00	7.20
Omaha, Neb.	17.93	26.90	4.50	3.60
Philadelphia, Pa.	29.46	44.19	8.25	6.60
Pittsburgh, Pa.	16.88	25.32	4.50	3.60
Portland, Ore.	77.21	115.82	23.63	18.90
Salt Lake City, U.	55.07	82.61	15.38	12.30
San Francisco, Calif.	79.84	119.76	23.63	18.90
Seattle, Wash.	77.21	115.82	23.63	18.90
St. Louis, Mo.	10.41	15.62	3.75	3.00
Toronto, Can.	17.71	26.57	5.63	4.50
Washington, D. C.	27.78	41.67	8.25	6.60

NOMINATIONS FOR THE GOVERNING COUNCIL

IN accordance with the By-Laws as amended in October, 1926, the Nominating Committee reports the following nominations for the Governing Council. The Constitution provides that "upon the petition of twenty-five Fellows, the Nominating Committee shall add the name of any Fellow to this list, provided such petition is received 15 days before the Annual Meeting."

The ten Fellows receiving the highest number of votes on a written ballot cast by the Fellows present and voting at the Annual Meeting in Chicago, will be elected for the 3-year term, 1928-1931.

Richard A. Bolt, M.D.,
Assistant Professor of Child Hygiene,
University of California,
Berkeley, Calif.

Hugh S. Cumming,
Surgeon General,
U. S. Public Health Service,
Washington, D. C.

Michael M. Davis, Ph.D.,
New York, N. Y.

W. J. V. Deacon, M.D.,
State Health Department,
Lansing, Mich.

J. G. Fitzgerald,
Connaught Laboratories,
University of Toronto,
Toronto, Ont.

Elizabeth G. Fox, R.N.,
American Red Cross,
Washington, D. C.

Leslie C. Frank, C.E.,
U. S. Public Health Service,
Montgomery, Ala.

Lee K. Frankel, Ph.D.,
2nd Vice-President,
Metropolitan Life Insurance Company,
New York, N. Y.

Norman MacL. Harris, M.B.,
Chief, Laboratory of Hygiene,
Department of Health,
Ottawa, Ont.

George D. Lummis, M.D.,
Middletown, O.

Professor, E. V. McCollum,
Johns Hopkins School of Hygiene and
Public Health,
Baltimore, Md.

A. T. McCormack, M.D.,
State Health Officer,
Louisville, Ky.

J. W. S. McCullough, M.D.,
Provincial Board of Health,
Toronto, Ont.

Sophie C. Nelson, R.N.,
Visiting Nurse Service,
John Hancock Mutual Life Insurance Co.,
Boston, Mass.

Stanley H. Osborn, M.D.,
State Health Commissioner,
Hartford, Conn.

George T. Palmer, D.P.H.,
American Child Health Association,
New York, N. Y.

Langdon Pearse,
Winnetka, Ill.

Roger G. Perkins, M.D.,
Cleveland, O.

J. L. Pomeroy, M.D.,
County Health Department,
Los Angeles, Calif.

Watson S. Rankin, M.D.,
Duke Endowment,
Charlotte, N. C.

Mazýck P. Ravenel, M.D.,
University of Missouri,
Columbia, Mo.

Evart G. Routzahn,
Russell Sage Foundation,
New York, N. Y.

William P. Shepard, M.D.,
Assistant Secretary, Welfare Division,
Metropolitan Life Insurance Company,
San Francisco, Calif.

William F. Snow, M.D.,
General Director, } of
American Social Hygiene Association }
New York, N. Y.

James A. Tobey, Dr.P.H.,
Borden Sales Company,
New York, N. Y.

S. W. Welch, M.D.,
State Health Commissioner,
Montgomery, Ala.

H. A. Whittaker,
State Board of Health,
Minneapolis, Minn.

C. F. Wilinsky, M.D.,
Health Department,
Boston, Mass.

Linsly R. Williams, M.D.,
Director, New York Academy of Medicine,
New York, N. Y.

NOMINATING COMMITTEE

Edwin O. Jordan, *Chairman*
Walter H. Brown John Sundwall
A. J. Chesley C.-E. A. Winslow

NEW MEMBERS

- Victoriano Agostini, M.D., Havana, Cuba, Chief of School Hygiene
- Ada H. Arlitt, Ph.D., Cincinnati, O., Professor of Child Care and Training, University of Cincinnati
- A. L. de Barros Barreto, M.D., Dr.P.H., Sao Salvador, Bahia, Brazil, Director State Board of Health (Assoc.)
- Miriam Birdseye, A.M., Washington, D. C., Extension Nutritionist, U. S. Department of Agriculture
- Hazel E. Branch, Ph.D., Wichita, Kan., Teacher in Preventive Medicine
- Harvey J. Burkhart, D.D.S., Rochester, N. Y., Director Rochester Dental Dispensary
- Francis L. Burnett, M.D., Boston, Mass., Research in Nutrition
- Mrs. William H. Carpenter, R.N., Salem, Va., Community Nurse
- Thomas J. Claffy, Chicago, Ill., Chief of Plumbing Division, Department of Health
- Lydia Clark, Columbus, O., Professor of Physical Education, Ohio State University
- Timothy R. Crowe, Chicago, Ill., President Sanitary District of Chicago
- Matthew A. DeLaney, Manila, P. I., Medical Officer, U. S. Army
- Chester F. Drake, D.Sc., Aspinwall, Pa., Superintendent Pittsburgh Filtration Plant
- Herbert C. Ellis, B.S., Detroit, Mich., Associate Structural Engineer, Detroit Water Board
- Robert B. Faus, M.D., Honolulu, T.H., Director Emergency Hospital
- Morris Fishbein, M.D., Chicago, Ill., Editor *Journal of American Medical Association and Hygeia*
- Helen W. Ford, Manhattan, Kans., Head, Department of Child Welfare and Euthenics, Kansas State Agricultural College
- Julio Freijanes, M.D., C.P.H., Guadalajara, Spain, Inspector Provincial de Sanidad, Gobierno Civil (Assoc.)
- Marie E. Fuller, R.N., Providence, R. I., Industrial Nurse
- Melvin S. Gaul, Chicago, Ill., (Assoc.)
- George A. Hastings, New York, N. Y., Assistant Secretary, State Charities Aid Association
- Scott W. Hollis, M.D., Abilene, Tex., City and County Health Officer
- Emily M. Hopkins, R.N., Logan, O., Public Health Nurse, Board of Health
- Omar C. Hopkins, S.M., Atlanta, Ga., Junior Assistant Sanitary Engineer, U. S. Public Health Service
- Wayne E. Ishyam, Los Angeles, Calif., Junior Sanitary and Food Officer
- Harvey P. Jones, B.C.E., Toledo, O., Consulting Sanitary Engineer
- Frank J. Keis, Fort Lauderdale, Fla., Consulting Engineer
- William H. Kelly, M.D., Sanford, Me., City Health Officer
- Eva Kingelin, R.N., Milwaukee, Wis., Industrial Nurse, Koehring Company
- George F. Lee, Johnstown, Pa., Chemist and Bacteriologist
- Harry G. Lindquist, M.S., Amherst, Mass., Instructor in Dairying, Massachusetts Agricultural College
- Eva F. MacDougall, R.N., A.B., Indianapolis, Ind., Director Division of Public Health Nursing, State Board of Health
- Merrill J. Mack, M.Sc., Amherst, Mass., Assistant Professor of Dairying, Massachusetts Agricultural College
- J. G. McMaster, M.D., Florence, S. C., City Health Officer
- Major John I. McWilliams, Pine Camp, Great Bend, N. Y., Construction and Sanitary Engineer
- Fred L. Moore, M.D., Blountville, Tenn., Director, Sullivan County Health Unit
- Robert P. Myers, Ph.D., M.S., Evansville, Ind., Bacteriologist, Research Laboratory, Mead, Johnson & Company
- Henry C. Niblack, M.D., Chicago, Ill., Chief Bureau of Child Welfare, Department of Health
- Charles M. Pearce, M.D., McAlester, Okla., Superintendent of Health, Pittsburg County
- Anne F. Pritchett, Hannibal, Mo., Red Cross Public Health Nurse
- Enrico Rangel, M.D., Rio de Janeiro, Brazil, Assistant in Vital Statistics, Department of Public Health (Assoc.)
- Margaretta W. Reeve, Philadelphia, Pa., Campaign Director, National Congress of Parents and Teachers
- Esther L. Richards, M.D., D.Sc., Baltimore, Md., Associate Professor of Psychiatry, Johns Hopkins Hospital, and Lecturer in Mental Hygiene, Johns Hopkins University
- Jane D. Rippin, New York, N. Y., Director of Section on Women and Girls of the War and Navy Department, Commission on Training Camp Activities, Girl Scout Health Program
- Clyde R. Salmons, D.D.S., Hartford, Conn., Chief Mouth Hygiene Department, Child Hygiene Bureau, State Department of Health

Harriet J. Sherman, R.N., Jacksonville, Fla.,
Field Supervisor Bureau of Child Hygiene
and Public Health Nursing, State Board of
Health

Irene M. Silesky, Minneapolis, Minn., Student
of Public Health, University of Minnesota

Mildred G. Smith, New York, N. Y., Staff
Associate, National Society for the Preven-
tion of Blindness

Mahidol Songkla, M.D., C.P.H., Bangkok,
Siam, Resident Physician and Pediatrician,
Siriraj Hospital, Chulalongkorn University
(Assoc.)

Alice M. Spangler, R.N., Lebanon, Pa., Nurse
Ellen E. Stevens, San Luis Obispo, Cal., Public
Health Nurse, San Luis Obispo County
Health Department

Henry Storgaard, M.D., Yakima, Wash.,
County and City Health Officer

James P. Stowe, Charlotte, N. C., Member
State Board of Health

Ira C. Tyndall, M.D., Berlin, Md., Health
Officer, Worcester County

William I. Van Arnum, Ph.G., Youngstown,
O., Chemist and Bacteriologist and Superin-
tendent of Filtration Plant

Rodrigo Varo, M.D., C.P.H., Lerida, Spain,
Provincial Health Officer, Gobierno Civil
(Assoc.)

Homer C. Vernon, Los Angeles, Calif., Junior
Sanitary Inspector

George I. Wallace, Ph.D., Urbana, Ill., Teacher
of Epidemiology, University of Illinois

F. Edward Whitehead, Ph.G., Trenton, N. J.,
Sanitary Chemist, Bureau of Engineering,
State Department of Health

Charlotte Whittton, M.A., Ottawa, Canada,
Executive Secretary Canadian Council on
Child Welfare

Marion C. Woodbury, R.N., Great Barrington,
Mass., Director Visiting Nurse Association

DECEASED MEMBERS

J. Ross Snyder, M.D., Birmingham, Ala. Mem-
ber elected 1919

John D. McCarthy, M.D., New York, N. Y.
Member elected 1928

APPLICATION FOR FELLOWSHIP

FOOD, DRUGS AND NUTRITION: Timothy J.
King, M.D., Chicago, Ill.

LABORATORY: Frank E. Greer, Chicago, Ill.
CHILD HYGIENE: Estella F. Warner, M.D.,
Salem, Ore.

UNAFFILIATED: Louis E. Schmidt, M.D.,
Chicago, Ill.

GEORGE W. PUTNAM ENGAGED AS RESEARCH ENGINEER

GEORGE W. Putnam, Fellow, A. P.
H. A., has been granted a year's
leave of absence from the position of
Chief, Bureau of Dairy Products, Chi-
cago Health Department, and is now
engaged as Research Engineer with The
Creamery Package Manufacturing Com-
pany with headquarters in Chicago.

DR. S. W. WELCH DIES

S. W. Welch, M.D., State Health Offi-
cer of Alabama since 1917, and past
president of the State and Provincial
Health Authorities of North America,
died of heart disease in Montgomery,
Ala., on August 22. He was the author
of several bills amending the medical
laws of Alabama. Dr. Welch has been a
member of the A. P. H. A. since 1917
and a Fellow since 1922.

DR. LOUIS I. HARRIS RESIGNS

LOUIS I. Harris, M.D., has resigned
as health commissioner of New York
City to become consultant to the Nation-
al Dairy Products Corporation in estab-
lishing a medical and sanitary service.

Dr. Harris was appointed health com-
missioner January 1, 1926, by Mayor
James Walker. Before resigning Dr.
Harris had completed 20 years' service
with the New York City Health Depart-
ment, and he will receive a pension of
\$5,000.

Dr. Harris is a Fellow of the A.P.H.A.
and a member of the Committee on Ven-
tilation, and of the Council of the Health
Officers Section.

On August 18, Shirley W. Wynne was
appointed by Mayor Walker to succeed
Dr. Harris.

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

Mortality and Morbidity in Relation to Latitude—In the densely populated sections of the country will be found a greater concentration of measles, diphtheria and scarlet fever in the early years of life. This has previously been demonstrated not only with respect to these diseases, but also to whooping cough and anterior poliomyelitis.

This tendency for measles and probably whooping cough seems to be independent of latitude or climate, but in diphtheria and scarlet fever, and apparently in poliomyelitis, the age distribution of deaths is found to be affected by another tendency, namely, a higher concentration in early childhood in tropical and sub-tropical climates. The explanation is offered that the greater concentration of diphtheria and scarlet fever in the early ages in tropical climates may be due to early and widespread immunity of the populations concerned. Sub-clinical infection would, therefore, be greater in the warm climates. This viewpoint is supported by other facts including the results of the Schick and Dick tests in tropical areas. The same explanation may hold for poliomyelitis.—James A. Doull, *Variations in the Age Distributions of Mortality and Morbidity from Diphtheria, Scarlet Fever and Certain Other Diseases in Relation to Latitude*, *Am. J. Hyg.*, VIII: 633 (July), 1928.

Diphtheria Prevention in Nurses—An accurate account has been kept of the incidence of diphtheria and scarlet fever among student nurses at the Durand Hospital of the John McCormick Institute for Infectious Diseases in Chicago since 1913. During the first few months after the opening of the hospi-

tal in March, 1913, no Schick test was employed on student nurses, and 18.4 per cent contracted diphtheria.

From October, 1914, to January, 1921, the Schick test was employed and antitoxin was given to most of the susceptibles. In the susceptible group who received antitoxin only 7.2 per cent contracted diphtheria as compared with 25 per cent who contracted diphtheria in the group of susceptibles not given antitoxin.

Beginning with January, 1921, toxin-antitoxin has been given to susceptibles. Among the susceptibles immunized to a negative test before entering the service of the institution only 0.6 per cent have contracted diphtheria. This represents but a single case in a total of 159 nurses.

The percentage of student nurses contracting scarlet fever and sore throat has decreased from 17 to 12.4 since the employment of the Dick test and immunization of susceptibles.—L. Hektoen and C. Johnson, *Prevention of Diphtheria and Scarlet Fever in Nurses*, *J. Prev. Med.*, II: 289 (July), 1928.

Epidemiology of Diphtheria—It has been recognized that the establishment of an infectious disease depends first upon the presence of the specific parasitic cause, and secondly, the susceptibility of the host. The degree of susceptibility determines whether the individual shall succumb to the disease or apparently remain healthy. Frost discusses a third result intermediate between these two—that is, the establishment of infection without manifest symptoms of the disease. He endeavors to establish a ratio for diphtheria between infections which result in the disease itself, and infections which result in

the establishment of specific immunity without the disease.

His figures are for the most part from a selected area in the City of Baltimore. The ratio may vary in relation to age, to race, to the circumstances of known exposure, and to the factors which have not been subject to analysis. The ratios obtained in Baltimore are obviously different from those obtained in other communities. Nevertheless, for the conditions of the study it may be stated that the demonstrable specific immunizations are to the recognizable case as 6 or 8 is to 1.

In response to the question of how does the frequency of bacteriologically demonstrable infection with (virulent) diphtheria bacilli compare respectively with the frequency (a) of clinical diphtheria, and (b) of specific immunization as indicated by the Schick test, the author concludes that in a representative urban population, in the broad age groups considered, bacteriologically demonstrable carrier infections are to clinical diphtheria roughly as 40 or 50 is to 1. —W. H. Frost, *Infection, Immunity and Disease in the Epidemiology of Diphtheria*, *J. Prev. Med.*, II, 325, July, 1928.

Visible Record Display Cabinet—

In order to enable the health administrator to keep in a compact and attractive manner statistical information concerning the functioning of his department, which he may desire to use for demonstration purposes, the Ohio State Health Department is encouraging the use of a Visible Record Display Cabinet.

The visible display cabinet showing cumulative records of a health department for a period of years on the basis of the A.P.H.A. *Appraisal Form* is the logical outgrowth of the monthly check sheet* devised by Dr. Harry H. Mustard, Director, Child Health Demonstration, Murfreesboro, Tenn.

The scheme for keeping yearly records available as a means for easily transporting them has been developed by Dr. Porter Crawford, District Health Commissioner, Troy, O., and Dr. E. R. Shaffer, Chief, Bureau of Local Health Organization, Ohio State Department of Health.

For the cabinet which is shown in the accompanying cut the Ohio State Health Department is having printed a

standard form of report card similar to the sample shown, consisting of 6 printed cards and 4 blank cards. The printed cards are for the purpose of tabulating the data relative to the various activities, and the blank cards are provided for the purpose of constructing graphs from local data at the pleasure of the local health commissioner. The State Health Department is endeavoring to have one of these cabinets installed in the office of each full-time health organization.

One of the interesting features pertaining to the prescribed form is that it is almost an exact duplicate of the department's annual report form which is based upon the survey portion of the *Appraisal Form* for city and rural health districts, recommended by the Committee on Administrative Practice of the American Public Health Association.

Inasmuch as this Visible Record Display Cabinet is portable, it is very convenient to transport within various points of a local health district, from which the health commissioner or other speaker may give a constructive lecture, and at the same time demonstrate the statistics and other data that would be available.

* See A Suggested Monthly Check Sheet, *A. J. P. H.*, 18:3, 302 (Mar.), 1928.

GENERAL HEALTH DISTRICT

		10 Year Record				
		1925	1926	1927	1928	1929
POPULATION						
	Official estimate					
	Local estimate					
	Classification of -					
	Percent Native Born					
	" Colored					
	" Foreign Born					
A - VITAL STATISTICS						
	Standard					
	Score Performance					
A-1						
	Deaths					
	Rate					
	Births					
	Rate					
	Stillbirths					
	Deaths from -					
	Infants - under 1 mo.					
	" 1 mo. to 1 yr.					
	" mortality rate					
	Acute Ant. Poliomyelitis					
	Diarrhea Ent. -under 2 yrs.					
	Diphtheria					
	Measles					
	Meningococcus meningitis					
	Scarlet fever					
	Smallpox					
	Typhoid fever					
	Tuberculosis--All forms					
	Whooping cough					
A-2						
	Checking and verification of certificates of deaths with reported cases					
A-4						
	Classification & compilation					
A-5						
	Interpretation & application					
B - COMMUNICABLE DISEASE CONTROL						
	Standard					
	Score Performance					
B-1						
	Number of reported cases					
	Acute Ant. Poliomyelitis					
	Diphtheria					
	Influenza					
	Measles					
	Meningococcus meningitis					
	Scarlet fever					
	Smallpox					
	Typhoid & Paratyphoid fever					
	Whooping cough					
	Tuberculosis					
	Others					
B-2						
	Record Keeping					
	Epidemiological case his- tories of major com. dis.					
	Correlation of information					
	Spot maps kept					
	Chronological charts					

LABORATORY

C. C. YOUNG

FERMENTATION TUBE

GEORGE G. SCHAUT

Chief Chemist, Bureau of Water, Philadelphia, Pa.

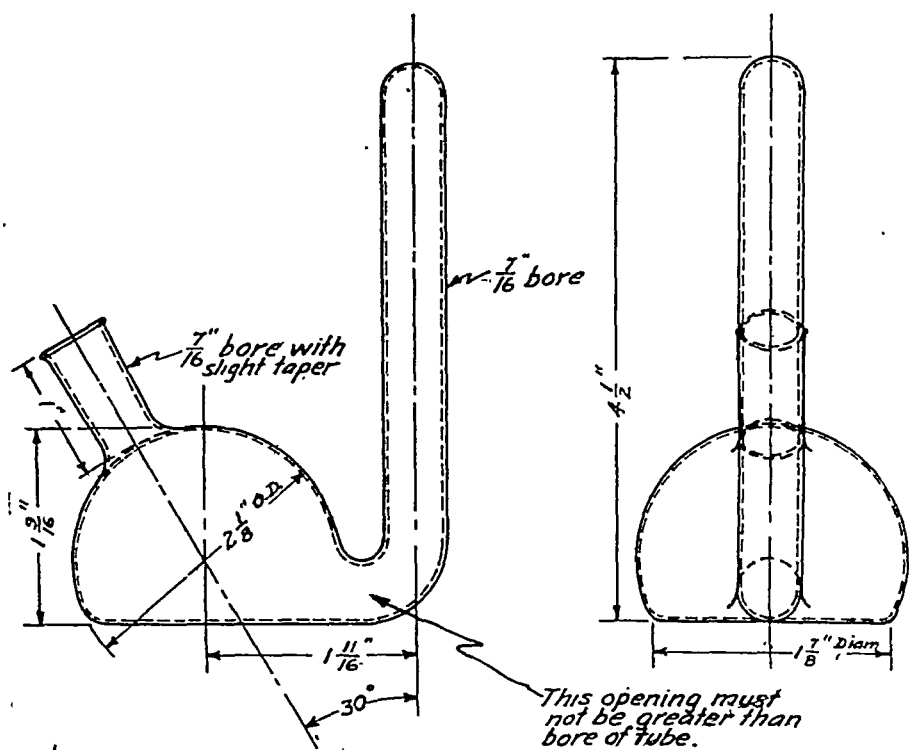
THE one piece type fermentation tube has always been more popular than the two-piece tube and is used with or without a pedestal base. When used without an integral base, the tube must be supported by some external means as a rack or clamp, whereas the type with the pedestal base is very fragile and the breakage excessive.

It has long been the desire of laboratories using the pedestal type to find

some way of stopping the breakage, for the writer has found in a laboratory purchasing 2400 a year the breakage in shipment alone was 10 to 15 per cent, a 10 per cent breakage upon first handling, and also a 10 per cent upon first sterilization. With this constantly in mind, the writer designed a tube (patent applied for), the type of which is shown in Figure I.

This is an integral piece of apparatus

FIGURE I
FERMENTATION TUBE
GLASS



and is used just the same as any Smith tube. This type of tube has been in use in our laboratory for some time and is found to be far superior to any fermentation tube at present on the market. By simply increasing the size of the bulb, it is possible to make tubes to contain quantities of inoculating water, of 50 and 100 c.c. Heretofore, no tube was available for 100 c.c. of water in one single inoculation.

The advantages of this type of tube are:

1. One piece tube
2. Requires no external support
3. Greater stability
4. Ease of handling
5. Not fragile
6. Less breakage
7. Increases the capacity of any incubator
8. May be manufactured in any size
9. Up to 10 per cent of gas is not lost in the arm if the tube falls over during incubation.

A SIMPLIFIED FLASK FOR RELATIVE STABILITY TESTS UPON SEWAGE

J. L. POMEROY, M.D., Fellow A. P. H. A.

and

R. V. STONE

County Health Officer, and Director of Laboratories,

Los Angeles County Health Department, Los Angeles, Calif.

IN 1915 Professor Ivan C. Hall¹ published a description of a new aerobic-anaerobic culture tube. This has become generally known as the "Hall tube." In principle, it is a modified potato tube, having a constriction about one inch above the bottom, this constriction being of a diameter that readily permits the sealing of the lower portion by a marble. Filled with nutrient broth, aerobic organisms propagate in the space above the marble, while anaerobic organisms grow in the space below.

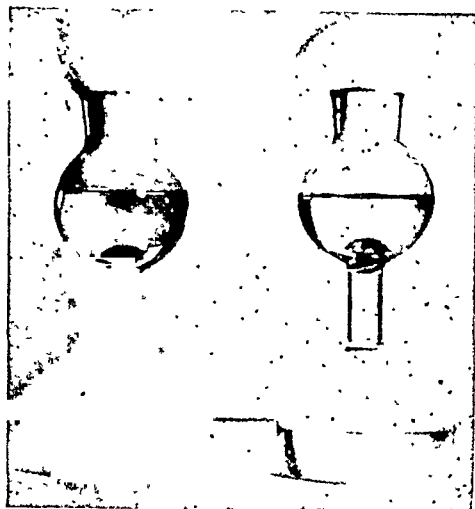
During the development of this tube it was our privilege to be associated with Professor Hall, and we were familiar with tests conducted by him in proving the efficacy of his method. One test that was utilized to detect tubes where the marble seal was faulty was to introduce methylene blue into broth filled tubes and then to autoclave with the purpose of driving out dissolved oxygen in the lower chamber. As a result the methylene blue lost its color. These tubes were

then held for a considerable period of time for observation. Where color reappeared in the lower portion, such tubes were discarded as imperfect.

Several years later the writer had occasion to conduct an extensive series of relative stability tests and, since most methods in use involved considerable care in assuring a perfect seal on the sewage samples during the test, it was thought that utilization of the principle of the Hall tube should expedite such testing.

A stock flask was selected, this being the Baird sugar flask as illustrated in this article. The 100 or 200 c.c. Kohlrausch volumetric sugar flask with enlarged mouth can also be used, but this is not so desirable as the Baird flask.

New flasks as received in this laboratory are measured for capacity up to the marble seal, and the amount of methylene blue to be added for this volume is marked with a carborundum pencil into the glass. These are then tested by addi-



BAIRD INCUBATING FLASKS

tion of sewage and methylene blue to each, autoclaving and observing for complete decolorization below the marble seal. Any flask which does not maintain its condition of anaerobiasis is discarded, this in actual practice being seldom necessary. Ordinary glass marbles are used for the seal.

In making the test, the sewage sample is poured into the flask, which is held tilted so that the marble rests in the curve, leaving the neck open. Sufficient

sewage is used to bring the level about half way up in the upper section. The methylene blue is then added by means of a 2 c.c. graduated serological pipette. The marble is then allowed to roll back into place, effectually sealing the neck. The test is now ready to incubate at 20°C. exactly as in any other method. A cotton plug is used to seal the flask during the test. By introducing a methylene blue dosage in the upper portion after the marble has sealed the neck, a good color control on each test has been established so that the beginning of a partial decolorization in the lower test portion is readily observed.

Kohlrausch 100 c.c. flasks list for \$.50 each, while the Baird flask of 200 c.c. capacity lists for \$1.00.

NOTE: When using the Kohlrausch flask it is necessary to sterilize the marbles in a separate package, and after adding sewage and methylene blue to the flask, the marble is placed in the neck by means of a Stoddart test tube clamp which can be flamed if absolute septic technic is desired. *These flasks are very satisfactory for growing in broth 100 or 200 c.c. quantities of anaerobic cultures for preparation of antigens or bacterins.*

REFERENCE

1. Hall, Ivan C. A New Aerobic-Anaerobic Culture Tube. University of California Publication in Pathology, 2:147, 1915.

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

The Cause of Fetal Death—In this study 144 cases were examined, all but 3 of whom came from the Whitechapel district of London. In 39 of these the fetus was macerated; in 99, it was still-born but not macerated, and in 6 the fetus breathed for a short time.

Of the macerated fetuses, 14, or 35.9 per cent, were proved to be syphilitic by the identification of the *Spirocheta pallidum* in the tissues. Of the remaining 25, death in 11 cases was due to toxemia of pregnancy which was indicated by maternal albuminuria; 1 death was probably due to maternal morbus cordis; 1 death was possibly due to fetal malformation; in 12 the cause of death was obscure, but in only 1 case were the examinations sufficient to exclude maternal albuminuria.

In 91 of the 99 stillborn non-macerated fetuses the necropsy showed that the fetus had suffered from asphyxia. In 73 cases (approximately 73 per cent of the total cases) asphyxia was the ultimate cause of death. Of the 6 infants who breathed after delivery, there was evidence at necropsy of asphyxia in 4; in 2 there was no such evidence, but intracranial hemorrhages showed that one of the causes of asphyxia, excessive pressure upon the head, had been present. Taking all the cases of non-macerated fetuses together: in 105 cases, death was primarily due to maternal disease in 27, to fetal malformation or disease in 5, and to labor in 73. While spirochetes were found in 14 of the 39 macerated cases, they were found in only one of the 105 cases of non-macerated fetuses. Syphilitic infection was found in slightly more than 1 per cent of the non-macerated, in 35.9 per cent

of the macerated fetuses, and in 11.3 per cent of the total 133 cases examined for syphilis.—A. C. Palmer. Child Life Investigations. Great Britain Medical Research Council. *Special Report Series, No. 118*, 1928. 112 p.

Automobile Fatalities in the Urban Industrial Populations of American States, 1927—In 1927, 3 out of every 10 fatal accidents of all kinds in the industrial populations of the United States and Canada, resulted from the operation of motor vehicles. Reports for the first 5 months of 1928 show that this type of accidents is now occurring even more frequently than in 1927. Among Metropolitan industrial policyholders, the death rate for negroes, in 1927 was 17.2 per 100,000, as compared with 19.1 for whites. Comparison with a study of 1923 shows a 32 per cent rise in the automobile death rate among the negroes, as compared with only 16 per cent for the whites.

The death rate for Canada is 10.9 per 100,000 among whites, whereas that of the United States is almost double with 19.1 for whites and 17.2 for colored. But the rate in Canada has increased more rapidly in recent years. In the United States, the mountain states with a rate of 22 for whites, and the South Atlantic states with 22 for whites and 22.7 among colored, show the highest rate of automobile fatalities. The lowest rates appear for the New England states, 15.4 for white and 8.5 for colored, and for the West South Central states with 14.7 for white and 17 for colored.

Despite the immense motor vehicle traffic of the cities of New York State, the death rate 16.8 for whites and 14.9

for negroes, is well below the average for the country, and for the adjacent states of Connecticut, New Jersey and Pennsylvania.—*Stat. Bull., Met. Life Ins. Co.* 9:6-8 (June), 1928.

Variations in Cancer Death Rates in Relation to Topography and Fuel—This study was based on three theories evolved by C. E. Green as a result of his investigations in the causes of the variations of cancer death rates in France, Scotland and England. These theories are summarized as follows: Open level districts of high or low altitude show lower rates than land in hollows or depressions or intersected by gullies, valleys or lying against adjacent hills. High rates from cancer accompany an excessive presence of SO₂ gas from the use of coal with a high sulphur content. Districts with uneven roof-lines have high cancer rates, because the resulting poor house and chimney ventilation increases the accumulation of SO₂.

Staten Island, in New York City, was chosen as the location for the survey because it presents a varied topography, and large parts of the island have suffered for many years from smoke, fumes and vapors from large industrial plants on the neighboring shores of New Jersey. The study was begun in November, 1920, and covered 515 cancer deaths among residents of at least 3 years for the period between 1914 and 1920. Adjustments for variations in diet and individual or parent nativity did not make any important changes in the rates. But the exposure to smoke fumes and gases from industrial plants or from coal stoves and hot air furnaces seemed to have a direct relation to mortality from cancer.

The rates for the 13 districts varied from 42.1 to 78.9 per 100,000 population. The 5 districts which were particularly exposed to the smoke from industrial plants in New Jersey all had

rates above 60. Only 2 districts that were not directly exposed had rates over 60, and these 2 districts, with rates of 69.6 and 76.3, were densely settled, level sections backed by high hills in which about 70 per cent of the population used coal stoves or hot air furnaces both of which methods of heating are likely to permit the escape of combustion products into the home. The 5 districts having the lowest rates, from 42.1 to 48.7 were only occasionally or indirectly exposed to the fumes of the industrial plants and, with but 2 exceptions, were sections in which at least 70 per cent of the homes used steam or hot water furnaces. The 2 exceptions were districts in which the majority of the people used coal stoves in which however a great deal of wood was burned, and the districts were so sparsely settled that there was little accumulation of fuel combustion products.

Variations in topography were somewhat less closely correlated to variations in cancer mortality. The 6 highest rates were found in districts with sloping or level land backed by hills, while the 2 lowest rates were in districts with level land. One section with high but fairly level land had a low rate, one with high sloping and intermediate land had a medium rate, one with comparatively level land had a fairly high rate, while one district which was considered fairly hilly, had a low rate.—Jerome Meyers *New York State J. Med.* 28:365-372 (Apr. 1), 1928.

Heart Disease in the Negro Race—From a study of 257 cases of heart disease admitted to Grady Hospital, Atlanta, Ga., it was observed that 3.7 per cent of all admissions to the general hospital were due to cardiac cases. Of the 257 cases with heart disease, 30 per cent occurred in the fifth decade, and 66.6 per cent occurred in the fourth, fifth and sixth decades. The incidence of

heart disease by decades is about the same in both the male and female groups.

Rheumatic heart disease is much more prevalent in the North than in the South. In the series of 257 cases 29.7 per cent were definitely syphilitic. From 20 to 25 per cent of negroes who contract syphilis sooner or later develop some evidence of cardiovascular syphilis. Among the cases of syphilitic heart disease 55.4 per cent had aortic regurgitant murmurs, and of this number 83.3 per cent were males.

Arteriosclerosis with hypertension or hypertensive heart disease without demonstrable arteriosclerosis, causes 60.1 per cent of all cardiac admissions, attended with high mortality. The disability is longest in the arteriosclerotic group, and it requires the longest hospitalization. The mortality is unusually high (44.8 per cent) because of the state of congestive heart failure in which these patients are received.—Hal M. Davison and J. C. Thoroughman. *South. M. J.*, 21:464-468 (June), 1928.

The After-History of Sanatorium-Treated Patients—The condition of 395 tuberculosis patients in the latter part of 1926 who had been treated in the King George V Sanatorium in the second half of 1922 has been traced. Of 384 cases of pulmonary tuberculosis, 35 per cent were dead, 20 per cent were capable of doing ordinary work, 9 per cent were doing some lighter work, 24 per cent were not able to work, 4 per cent were undergoing further institutional treatment and 7 per cent were untraced. When these were divided into T.B. + (cases in whose sputum the tubercle bacillus has been demonstrated on one or more occasions) and T.B. — (cases in whose sputum the tubercle bacillus has never been demonstrated),

the percentages were respectively: 39 and 13 dead, 18 and 30 doing ordinary work, 8 and 16 doing lighter work, 24 and 25 unable to work, 3 and 9 undergoing treatment, and 7 and 8 not found. There were 11 cases in which diagnosis of tuberculosis was not confirmed and of these 9 per cent were dead, 36 per cent were doing ordinary work, 27 per cent were unfit to work and 9 per cent were being treated. These figures compare favorably with sanatorium figures in 1914 and 1915, when 70 per cent of all cases treated in sanatoriums were dead in 4 years.

If these figures be divided into those representing the different periods of life, we see that the results remain remarkably constant. Of the T.B. + cases, the percentage of deaths between ages 16-24 was 42 and between 25-39, 40; and 40 and over, 35. Of the T.B. — cases, 10 per cent of the 16-24 age group were dead, 8 per cent of the 25-39 group and 21 per cent of those over 40. This appears to indicate that age has no very striking influence on the ultimate prognosis.

When the cases are subdivided by the Turban-Gerhardt classification, 16 per cent of those in stage I had died and 41 per cent were working. Of those in stage II, 21 per cent had died and 36 per cent were working and of those in stage III, 56 per cent had died and 16 per cent were working. If they are divided according to progressive degrees of systemic disturbance we find that 22 per cent of those in class A had died, 56 per cent of those in class B and 65 per cent in class C. On the whole the systemic factor is of more use in evaluating prognosis than the local disease extent factor.—C. O. S. Blyth Brook. *Tubercle*. 9:167-171, (Jan.) 1928.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C.E.

Pollution of the Mississippi River in the Vicinity of Minneapolis and St. Paul—The basic data collected during a study of the pollution of the upper Mississippi River, between Minneapolis, St. Paul and Winona, Minn., collected during a joint investigation by the U. S. Public Health Service, the States of Minnesota and Wisconsin and the cities of Minneapolis and St. Paul, during the period June, 1926—August, 1927, have been made available, in mimeograph form, for the use of the coöperating agencies, to assist in the solution of the sewage disposal problem existing in that portion of the Mississippi River.

The report contains summarized results, as monthly averages, of the chemical and bacteriological examinations and hydrometric data. Population estimates, estimates of sewered population, population equivalent to industrial wastes and other pertinent data are presented.

The disposal of the sewage of the Twin Cities, by dilution, is complicated by a dam located below Minneapolis, behind which there is a considerable deposition of sewage solids from the city sewage as a result of decreased velocity in the river. The problem of the disposal of the sewage from the remainder of the metropolitan area will be still further complicated by the construction of a second dam in the near future, which will form a second pool immediately below the present one and will decrease the velocity in the river through St. Paul and South St. Paul.

Indications are that the sewage load in the river will increase so that objectionable conditions through the Twin Cities and as far down stream as Hastings will be of frequent occurrence in the future. The formation of the second

pool will intensify the present objectionable conditions.

Studies of methods of sewage disposal are being conducted by the Metropolitan Drainage Commission, created by the last legislature and by the Minnesota State Department of Health. It was primarily to make available the basic data relative to conditions existing in the river for the use of these state organizations, that the preliminary report was prepared—H. R. Crohurst. Unpublished report made under supervision of U. S. Public Health Service in coöperation with the States of Minnesota, Wisconsin and cities of Minneapolis and St. Paul. 86 pp. Abstr. H. R. Crohurst.

Public Works of the Ruhr Sanitary District—The Ruhr River Sanitary District was established by a Prussian law on June 5, 1913. Its sole purpose is to prevent pollution of the Ruhr River and its tributaries. The total population contributing is about 1,300,000. Industrial wastes are contributed by coal mines, iron and steel works, tanneries, textile works, and cellulose and paper works. According to the law, one-third of the cost of carrying on the work of the district is paid by the water works, since they are considered as receiving the greatest benefit.

Most of the construction work has been carried on in the last 4 years during which time total expenditures for the years were as follows: 1923, \$472,000; 1924, \$710,000; 1925, \$1,150,000; 1926, \$1,970,000; 1927, estimated, \$2,140,000.

The works consist of sewage disposal units, sewerage systems, and pump plants. To date 36 disposal units, 56.5 miles of collecting sewer and 5 pump plants have been built. For 3 towns

located near the mouth of the Ruhr, a collecting sewer 6.8 miles long was constructed which carries this sewage to the main stream, the River Rhein.

In other sections where it was impossible to divert sewage directly to the Rhein, various types of disposal plants have been installed. The methods of treatment used at various places are listed in this article and there are a number of photographic views.

Separate sludge digestion is used in one town of 16,000 and in another of 12,500. A sludge digestion tank in which the sludge is heated is used at one place. The sludge digestion tank was installed as an addition to the original Emscher tank. Heat is obtained by burning the gas from the treatment plant. Chlorination of sewage is used only to a limited extent. An activated sludge plant is used at Essen-Rellinghausen, population 45,000. There are very few treatment plants for handling industrial wastes alone and it has been the general rule to mix the wastes with domestic sewage and treat the mixture.—Karl Imhoff. Pamphlet in German, June, 1927. 8 pp. Abstr. A. L. Dopmeyer.

German Developments in Refuse Disposal—The developments of refuse disposal in Germany since 1893 are set forth briefly in this article. The shaft furnace in which heavy layers of refuse are burned was first developed at Hamburg. Other recent and successful developments are the removal of combustion residues by machinery, and in 1925 the installation of fire tube boilers in combination with the furnace unit. At the Hamburg plant, consisting of 12 furnace units, 4 of which are equipped with fire tube boilers, 1 of these units was replaced with a furnace provided with a grate residue remover and a vertical tube boiler. Tests on this unit indicate that it will handle 80 tons of refuse per 24 hrs. as compared to 30 tons per 24 hrs.

for the old units. Further successful developments along this line are an increased grate area, a slack-forming zone of water cooled iron surface covered with stone, the vibrating or oscillating blower, and the air heater. Combustion usually lasts about 20 minutes. The flue gases pass through the ashing chamber where they are burned further, and then successively through a fire tube boiler, a flue chamber with steam superheater, 2 horizontal flue-tube boilers, a second flue chamber, electric filter and chimney. The by-products of the plant are 45 to 50 per cent slack; 1 per cent old iron; 0.7 per cent magnetic slack; 5 to 20 per cent flying ash; 0.55 to 3.3 lbs. steam per lb. of refuse; 353 to 530 cu. ft. of hot water at 122° F. in 1 hr. from 1 furnace unit.—John H. D. Blanke. *Am. City* 38:87 (Feb.), 1928. Abstr. J. B. Harrington.

We Want Pure Air in Our Towns—The author feels that we should make an effort to furnish city dwellers with pure air just as we furnish them with pure water. On March 22, 1926, he says, two members of the French Academy presented the following analysis of material which fell on a gauge placed in the center of Paris:

Carbon	2,659	grs.	per	sq.	meter
Hydro-carbons	1,824	"	"	"	"
Sulphuric acid	2,432	"	"	"	"
Chlorine	0,253	"	"	"	"
Ammonia	0,021	"	"	"	"

A further analysis made at Vitry disclosed 1,592 kilograms of soot to the square meter during the month of February. He ascribes this latter figure to the use of coal rich in ash. The reaction of the distillation by-products of coal with Paris water which has been purified by chlorine is such as to produce an iodoform taste in the water sufficient to render the liquid at times undrinkable, according to the author.

A Draft Law has been brought before the Chamber of Deputies which will per-

mit the authorities to proceed to study this problem and remedy the present state of affairs. Louis Forest. *World's Health*, 9:86 (Mar.), 1928. Abstr. Leonard Greenburg.

Atmospheric Pollution With Arsenical Dust—This study arose because of a complaint that the dust from a power generating station was a nuisance and that it contained arsenic to the extent of 125 p. p. m. Accordingly, samples of dust were taken from the roof, rain water gutters and chimney shaft of the power plant and several factories in the neighborhood. The pulverized coal used at the power plant contained but 3 p. p. m. of arsenic, whereas the samples from the roof of the plant contained from 50 to 175 p. p. m.; from rain water gutters from 100 to 200 p. p. m.; and from flue dust from 7 to 500 p. p. m. Despite the fact that the pulverized coal apparently contained so little arsenic, it is the author's belief that all of this arsenic originated in the coal being burned. It is pointed out that various types of coal may contain considerably larger amounts of arsenic than found here.

The question arises as to the health hazard brought about by the presence of this amount of arsenic in the furnace dust discharged in the atmosphere. It is conceivable that a workman might inhale more than that amount of arsenic which is specified as being the maximum permitted on imported apples. The requirements for apples at the present time specify that not more than 1/100 of a grain of arsenic per pound of apples is desirable. The author concludes that workmen engaged in cleaning out furnace flues would inhale more than this

quantity of dust, but there is no knowledge of any injury from this cause.

In conclusion, the author points out that the Public Health Smoke Abatement Act should tend to lessen atmospheric pollution of this nature.—G. Sowden. *J. State Med.*, 35:668 (Nov.), 1927. Abstr. Leonard Greenburg.

Sludge Thickening and Discharge—In some laboratory tests, it was found that the slow stirring of dilute suspensions of mud in water caused a concentration of sludge in 10 hours that was not equalled in 47 to 75 hrs. of quiescent settling. Tests were made with an experimental Dorr clarifier in which three methods of discharging sludge were tried: (1) discharge through a swivelled pipe which could be readily swung up or down to control the discharge head; (2) combinations of the swivel pipe and different sized orifices; (3) by the use of a diaphragm pump.

The conclusions drawn from the tests were: (1) The clarifier demonstrated its ability to thicken river mud and to discharge the sludge with a water loss of less than 1 per cent; (2) for the handling of this type of sludge, the piping should be free from shoulders or any obstructions; flange joints being recommended; (3) either orifice or swivel discharge may be used, but either will require careful manipulation and fairly close attention; (4) the diaphragm pump handled and controlled the sludge discharge without any difficulty, and could consistently remove sludge of a greater density than could be continuously discharged through an orifice or through the swivel pipe.—A. W. Bull and G. M. Darby. *Water Works*, 67:76 (Feb.), 1928. Abstr. H. B. Hommon.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M.D., AND LEONARD GREENBURG, PH.D.

A New Test for Industrial Lead Poisoning. The Presence of Basophilic Red Cells in Lead Poisoning and Lead Absorption—According to this contribution, the action of lead and certain other toxic substances which affect the bone marrow, is to produce an out-pouring of miniature red cells from this tissue. These miniature red cells are thrown out in the circulation in an amount depending on the degree of irritation of the bone marrow. It is possible to distinguish the miniature red cell by its morphological and staining characteristics. Dr. McCord makes use of the fact that the miniature red cells contains basophilic material to provide a test for these cells. Thick blood smears are made on ordinary microscope slides and are dried in the air. Staining (without fixing) is done by means of a dilute, acidulated methylene blue or hypotonic saline methylene blue, or lastly by Manson's methylene blue. After 10 minutes of staining the excess is drained and the slide is washed in distilled water. It is dried and examined under the oil immersion lens without a cover slip. Red cells appear as a light ring of material while the basophilic cells possess granulated blue dots in a cell of reticulated nature.

The clinical studies on both normal (control) and exposed persons disclosed the following facts:

1. Normal persons usually have less than 1000 basophilic cells per cubic millimeter of blood, and always have less than 5000 such cells.
2. The number of basophilic cells is increased in lead, benzol and arsenic poisoning.
3. Frank cases of lead poisoning invariably present basophilic counts in excess of 7,000 cells, the usual range being from 7,000 to 50,000 cells.
4. Very high basophilic counts may be

present, as high as 60,000 to 80,000 without any signs of clinical lead poisoning.

5. Lead workers presenting basophilic counts in excess of 6,000 to 7,000, should be accepted in the absence of other causative agents as being poisoning subjects and should be treated accordingly.

The conclusions of this paper are based on a study of more than 1000 persons in various employments; of these 550 were lead workers exposed in varying degrees.

This would appear to be a very fundamental contribution and merits testing and use at the hands of those interested in lead and benzol poisoning.—Carey P. McCord, M.D. U. S. Department of Labor, Bureau of Labor Statistics *Bulletin* 460, Washington, 1928. L. G.

Occupational Mortality Among Males in England and Wales, 1921-1923—A Summary of the Report of the Registrar General—This is an abstract and digest of Part II of the 1921 Decennial Supplement of the *Report of the Registrar General of England and Wales*. It will be recalled that in 1912 the Registrar General published a report of a similar type dealing with occupational mortality during the years 1910, 1911 and 1912. The present report is similar to that of 1912, and is very thoroughly and comprehensively reviewed by Mr. Britten of the Statistical Office of the U. S. Public Health Service.

To one not familiar with this particular report of the Registrar General a hasty review would yield but a limited amount of information. The report is rather complex in nature and we are, therefore, particularly fortunate in having this excellent summary and digest prepared by Mr. Britten. It is impos-

sible to give the results of this digest in a brief abstract. Suffice it to say that the mortality rates are obtained with reference to social distribution, fertility and infant mortality, specific occupational groups with reference to major causes of death, mortality by age from a few of the causes in the larger occupational groups, a complete summary of standardized rates by occupation, and a comparison of these rates with the rates for the years 1910-1912.

The attention of all workers in the field of industrial hygiene and those interested in the vital statistics of occupation is invited to this paper.—Rollo H. Britten, *Pub. Health Rep.*, 43, 25: 1565 (June 22), 1928. L. G.

Cause of Occupational Dermatitis in Sydney Rubber Works in 1927—Studies in Industrial Hygiene, No. 11—Studies were conducted in two rubber factories manufacturing goods of such a type as to warrant comparison between the two plants. In one of these factories but 1 case of dermatitis had occurred among 250 employes in a period of 1 year. In the second factory during this same time there had been 136 cases of dermatitis among 1,500 employes. In this factory, designated as Factory B, 111 of the 136 cases occurred in shoe making, tire building and in the mill department which supplies stock for the whole factory. A comparison between the working processes and compounds used in the two factories revealed the fact that the excessive amount of dermatitis in this factory was due to the use of the three following substances:

1. The use of a butyraldehyde condensation product of dimethyl-paraphenylene-diamine as an accelerator.

2. The use for an isolated period of hexamethylene-tetramine as an accelerator for certain classes of goods which resulted in an outbreak of fissured palms and fingers in tire builders, due apparently to an unusual liberation of formaldehyde as a decomposition product.

3. The use of benzine for cleansing hands and arms.—

Charles Badham and K. R. Moore, Extract from the *Report of the Director-General of Public Health, New South Wales, for the Year ended 31st December, 1926*. Section I C. L. G.

Respiratory Diseases as a Cause of Disability Among Industrial Workers—This recent study of 10 years' illness and absence records of the Edison Electric Illuminating Company of Boston showed that some 54 per cent of the absences of men on account of sickness were caused by the respiratory group of diseases. A similar type of study made among the members of several industrial sick benefit associations disclosed the fact that some 47 per cent of all illnesses were in this group. From these studies it was found that when all cases of disabling sickness, as well as when only those cases causing a disability of one week or more were considered, the respiratory diseases constituted approximately one-half the total number of cases. It is obvious from this that for its effect on the absence rate, the respiratory diseases are of paramount importance.

A more detailed consideration of the respiratory disease absence rates of the Edison Electric Illuminating Company revealed the astounding fact that common colds account for 71 per cent of all of the respiratory disease cases. These, however, are of rather short duration, for when one considers the respiratory diseases causing disability for 8 consecutive days or longer the common cold practically loses its significance.

The seasonal trend of the respiratory disease follows the usual well known trend in the average community, the peak being in the months of January, February and March.

Some very interesting figures are cited showing the variation in the rate for

respiratory diseases among the employes of different industrial organizations, the rate varying from a maximum of 85 per 1,000 men employed to 17 per 1,000. The importance of this variation is clearly indicated by the author.—Dean K. Brundage, *Pub. Health Rep.*, 43, 11:603 (Mar. 16), 1928. L. G.

Industrial Poisoning Cases Among Watch Dial Painters—The effect of the use of radioactive substances on the health of workers using these materials in the painting of clock and watch dials, has recently been brought to the public attention once again through the lawsuit filed against the United States Radium Corporation of Orange, N. J. According to the present paper 14 girls who have been employed in this plant at various times since 1917 have died as a result of the absorption of radium. In addition, there have been 3 deaths reported among watch dial painters of Waterbury, Conn.

The case against the United States Radium Corporation was settled out of court with an agreement providing that each of the victims is to receive an immediate cash payment of \$10,000, an annuity of \$600, and an allowance for medical and legal advice. It is reported that one of the original workers with this substance, formerly an official of the United States Radium Corporation and the person who originated the formula for the luminous paint used in the New

Jersey plant, is at the present time a victim of radium poisoning.—*Month. Labor Rev.*, 27, 1:42 (July), 1928.

L. G.

High Death Rate from Pneumonia Among Iron Foundry Workers—In an analysis covering the 3-year period from 1922 to 1924 inclusive a particularly high death rate from pneumonia is indicated. This study shows that 15.9 per cent of all deaths among iron foundry workers insured by the Metropolitan Life Insurance Company were due to pneumonia, while 7.7 per cent among all occupied males were due to this same disease. The age distribution of the disease showed the same trend, being higher for each age of the chief working periods of life, from 15 to 64 years.

The study further discloses the interesting fact that of 74 occupational classes analyzed 15 had death rates in excess of that for all occupied males. The paper discloses the three distinct types of hazards associated with a high pneumonia rate, namely, dust, extreme heat, and exposure to sudden variations in temperature.

Some of the most significant groups having high pneumonia rates are iron, steel and foundry workers, cordage and hemp mill operatives, polishers on iron and steel products, underground coal miners, etc.—*Stat. Bull.*, Mar., 1928; Metropolitan Life Insurance Company. *Month. Labor Rev.*, 26, 6:51 (June), 1928.

L. G.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

The Blacktongue—Preventive Action of 16 Foodstuffs—The production in the dog, by certain diets, of a pathological condition regarded as identical with blacktongue, and its correction by an element present in yeast, appears in work previously reported from this laboratory (*Pub. Health Rep.* 41:297; 43:172 & 657; 40:54). The resemblance of this disease to pellagra in man and the fact that it is corrected by an element in yeast which is known also to contain the pellagra preventive (factor P-P) suggests the probability that these diseases are fundamentally identical. The blacktongue preventive action in the 16 foodstuffs here recorded was undertaken in view of the application of the information to the treatment of pellagra. Both curative and preventive procedures were used on the experimental dogs.

Details are given as to the duration of all feeding experiments, clinical symptoms and composition of the various diets with the following conclusion: Eleven foodstuffs—maize, wheat germ, cowpea, soy bean, milk, butter, cod liver oil, tomatoes, carrots and rutabaga—have been studied for preventive action, both in blacktongue and pellagra. In 8 of these—maize, wheat germ, cowpea, milk, butter, cod liver oil, lean beef, and tomatoes—the preventive potency for pellagra is similar to that for blacktongue. With the remaining 3—rutabaga, carrots, and soy bean—the pellagra preventive action is not sufficient to permit comparison. It appears that so far as study has been made, all foodstuffs which are sources of blacktongue preventive are also dependable as pellagra preventive. Those which are defi-

cient in properties which correct the former disease are also poor sources for the prevention of pellagra. Of the remaining foodstuffs studied, whole wheat was found to contain the blacktongue preventive, but in small amounts. Cottonseed oil contains little if any blacktongue preventive. Pork liver and egg yolk contain blacktongue preventive, but their value in pellagra has not been studied. Canned salmon contains the blacktongue preventive. A study of its effect on pellagra is in progress. On the basis of experiments here recorded on dogs, it is recommended that liver, salmon and egg yolk be used for treatment and prevention of pellagra in human beings.—Joseph Goldberger, G. A. Wheeler, R. D. Lillie and L. M. Rogers, *Pub. Health Rep.* 43:1385 (June 8), 1928.

The Rôle of Aluminum Compounds in Animal and Plant Physiology—Previous investigators have reported widely varying contents of aluminum in animal and plant material. The fact that the early investigators reported the greatest amounts of aluminum in the same material has led to the belief that the refinement in analytical methods has resulted in considerable revision of our knowledge on this subject, and has raised the question if even recent figures are not higher than is actually the case. The wide distribution of aluminum in nature makes difficult the preparation of analytical reagents free enough from this element to be useful in biological assays. The authors have, therefore, had recourse to spectrographic methods of determining aluminum. The work was undertaken because of the widely divergent views of investigators at the present

time as to the effect of aluminum upon health, since these opinions vary—from those who regard it as a toxic element to those who regard it as a biological essential.

Spectrograms are shown of the various ash material studied. The authors found that various plant products; cereals, potatoes, carrots, and cottonseed meal; and animal products; hens' eggs and various organs of the rat, gave spectrograms in which no aluminum line was present, indicating less than 0.5 p. p. m. aluminum. The exceptions were rat skins, intestinal walls and lungs, which gave spectrograms indicating the presence of about 0.5 p. p. m. aluminum. The explanation is that these organs are absorbed.

exposed to air, dust and dirt, which are

Young rats, raised to maturity, on diets containing aluminum compounds compared in every respect to control rats under similar conditions but with the aluminum eliminated from the diet. Two experiments were undertaken—one in which the diet contained 0.6 per cent of aluminum chloride and in the other 3 per cent of a commercial brand of a sodium aluminum sulfate, calcium acid phosphate baking powder which had been decomposed by water and heat previous to feeding. The aluminum chloride and baking powder diets represented respectively 0.067 and 0.063 per cent of metallic aluminum. The growth curves and photographs of controls and tests show that rats receiving in the diet 600 p. p. m. of metallic aluminum in either form were the same in growth, reproduction, and general appearance as the control rats. A number of the young rats of both test groups were examined chemically after ashing the entire bodies of the baby rats and in the case of the older rats by ashing the individual organs. The ashes of the bodies of the baby rats and all of the individual organs, except the skin, lungs and intestinal walls gave

spectrograms indicating not more than 0.5 p. p. m. of aluminum in the various tissues. The skin, lungs and intestinal walls contained slightly more than 1 p. p. m.

To determine the degree of absorption by the intestines, rats were placed on control diet, and on the two aluminum diets, and spectrograms made of the intestines after thoroughly washing the tracts in distilled water. All spectrograms showed aluminum less than 1 p. p. m.; but neither of the methods showed more than in those on the aluminum-free diet indicating that the intestinal tract does not absorb or combine with the aluminum in the diet. The livers, kidneys, spleens, ovaries and testes of rats which had subsisted on test diet for 8 months were found to contain less than 0.5 p. p. m. of aluminum. The excreta of the rats, both control and on the diet, were examined for aluminum, resulting in all cases in an increased content of this element, further suggesting that the aluminum in the diet is excreted without passing through the walls of the alimentary tract.

This investigation indicates that while aluminum is not toxic, neither is it a biological essential so far as the rat is concerned. The results of this experiment confirm the findings of the Remsen Board of Consulting Scientific Experts which reported on a study on human subjects of the effects of diets containing biscuits baked with the sodium aluminum sulfate type of baking powder. It is proposed to continue this study with such biological, rare elements as manganese, zinc, boron and arsenic.—E. V. McCollum, O. S. Rask, and J. Ernestine Becker, *J. Biol. Chem.* 77:753 (May), 1928.

Iron Content of Plant and Animal Foods—The authors previously reported (*J. Biol. Chem.* 74:433) the iron content of certain tissues. In this paper are

reported the percentages of iron in about 150 samples of common food materials, fruits, vegetables, poultry and fish. Tables are given showing the iron content for each food product studied, ranging from 0.00015 per cent for lemon juice to 0.0192 per cent for parsley. This figure for parsley greatly exceeds any reported for spinach, a vegetable noted for its high iron content. Dried legumes were found to contain the highest percentage of iron, followed by green leafy vegetables, dried fruits, nuts, cereals, poultry, green legumes, roots and tubers, non-leafy vegetables, fish, and fruits. It was found that vegetables such as cabbage, celery and head lettuce, containing little chlorophyll, are low in iron. The soil and climatic conditions largely determine the iron content of plants, as is evidenced by the great variation in iron content of different samples of the same material. Salt water fish contain more iron than fresh water fish, and fish with dark colored tissues contain more iron than the light colored. Likewise, the dark meat of poultry is higher in iron than white meat. A comparison is given between the figures found in this experiment and those reported by Sherman (*Chemistry of Food and Nutrition* (3rd. ed.), 1926), which emphasizes the need of more analytical data on the mineral content of foods.—W. H. Peterson and C. A. Elvehjem, *J. Biol. Chem.* 78:215 (June), 1928.

Sanitary Quality of Some Commercial Milk Powders—One hundred samples of commercial milk powders obtained from groceries, bakeries and sim-

ilar places in Baltimore, representative of the city supply, were studied both bacteriologically and chemically. The bacteriological examination included plate counts, Breed counts, the determination of *B. coli* and search for the presence of the organism of tuberculosis. Both plate counts and Breed counts varied enormously, and the average respective counts from this source show a minimum of 1,000 to a maximum of 3,140,000 for the plate count and a minimum of 2,100,000 and a maximum of 37,000,000 for the Breed count. In no single case were viable tubercle bacilli found by guinea pig inoculation, and the *B. coli* count was in general around 5, with an extreme variation of 500. The chemical data included the total nitrogen and the per cent of this as ammoniacal and as amino acid nitrogen. A comparison between the Breed count and the nitrogen figures indicates an increasing amount of bacteria as the ammoniacal nitrogen increases. The amino acid nitrogen shows no constant relationship to the bacteria. The conclusions are drawn that the milk supply from which these powders were made was excessively high in bacteria and that proper sanitation does not obtain in the milk plant or in trade channels. From this work the authors are led to make the following statement: "Therefore, the finished product under the present conditions of manufacture and handling cannot claim to be the equivalent of the milk supply even when poorly controlled from the sanitary standpoint."—J. H. Shrader, C. L. Ewing, F. A. Korff and Lillian W. Conn. *Am. J. Hyg.*, 8:386 (May), 1928.

CHILD HYGIENE

MERRILL E. CHAMPION, M.D.

Improving the Practice of Obstetrics—Dr. J. R. McCord, of Atlanta, has some definite ideas with regard to needed improvements in the practice of obstetrics. He insists that good obstetrics can be done in the home and is being done there without mortality and with a low morbidity, but he feels sure that obstetrics, being a science, calls for long and intensive training on the part of those who are to practice it. When individuals insufficiently trained attempt midwifery, lives are going to be needlessly lost and much unnecessary suffering caused.

To McCord there are two necessities for an obstetrician. One is a full knowledge of the mechanism of labor and the other is a bountiful store of patience. Soap and water, he says, together with a safety razor and a pair of rubber gloves, complete an ample equipment.

The general surgeon, in the opinion of the author, rarely has the accurate knowledge of the mechanism of labor that he should have, and consequently, "results in hospitals, if statistics are to be believed, are quite as deplorable as those in the home." The important point is not whether the patient is in a hospital, but who is attending her. He thinks that the ulterior motive behind painless labors is too often shorter labor for the physician. Lastly, he feels that "an outdoor obstetric service, at best but poorly supervised, is the wrong way to give men their practical experience in obstetrics."—*What is Needed to Improve the Practice of Obstetrics*, Dr. J. R. McCord, J. A. M. A., July 21, 1928, pp. 201.

Home Care of the Mouth—In the *Journal of the American Dental Association* is found a bulletin which is one of

a series on teeth and their care prepared for the information of the public. It is compiled by the American Academy of Periodontology. It sets forth that the intent of "home care of the mouth is to aid in protecting the teeth from dental decay; to preserve and promote the health of the tissues which support the teeth in the jaws; and to provide a clean environment for the masticating machine and also for the food which is prepared for digestion in the oral cavity."

This bulletin goes on to discuss various phases of hygiene of the mouth. It points out that a good set of natural teeth is of little use unless the supporting tissues are healthy. It advocates massage of the gums by the correct use of the tooth brush. It points out that faulty diet is a serious factor in diseases affecting the teeth and gums and recommends the usual modern well-balanced ration.

To accomplish results, all that is necessary according to this bulletin is (1) two small toothbrushes with two rows of tufts set fairly wide apart; (2) dental floss or tape of medium width; (3) dentifrices which, however, should not be relied upon to take the place of the proper use of the toothbrush; (4) mouth washes, which are not indispensable (A good one may be made by dissolving a level teaspoonful of salt in a glass of water); (5) a wall mirror for use in guiding the various steps in toothbrushing and taping; the mirror is also necessary to check up on results; (6) a clock to check up on time spent on the care of the mouth. A time allowance of not less than nine minutes a day is suggested for brushing and taping. Smokers and those who overeat should take longer. Extra

time should be taken for massage of the supporting tissues of the teeth. Where brushing is not feasible, as is often the case with office workers at lunch, the mouth should be rinsed thoroughly with water.

Various other good advice is offered in this bulletin concerning methods or technic.—The Home Care of the Mouth, *J. Am. Dental Assn.*, July, 1928.

The Danger of Serum Reaction—The fear is frequently expressed that injections of antitoxin and toxin-antitoxin may pave the way for unfortunate serum reactions if subsequent immunological procedures are undertaken. Dr. Sophie Spicer, in the *Journal of the American Medical Association*, gives the results of a study made on a series of 237 patients suffering from diphtheria and scarlet fever who received antitoxin at the Willard Parker Hospital in New York.

Care was used to study the histories thoroughly and information was obtained from parents of the patients concerning previous experiences with immunizing agents.

The conclusion to which Dr. Spicer comes is: "Previous administration of toxin-antitoxin appears to have little or no effect on subsequent serum treatment."

It should be said that one reason for the comparatively mild type of serum reaction which the author observed in her series was the giving of the antitoxin in small divided doses to patients who on test reacted for horse serum sensitivity.

It would seem that Dr. Spicer is right in her conclusion that clinicians as a whole have been overconcerned with the possible untoward results likely to follow

if serum is administered subsequent to previous doses of antitoxin and toxin-antitoxin.—The Effect of Previous Administrations of Antitoxin and Toxin-antitoxin on Serum Reaction, Sophie Spicer, M.D., Dr.P.H., *J. A. M. A.*, June 2, 1928, pp. 1778.

The Chief Causes of Deafness—"Almost half of a typical group of nearly 4,700 children of 12 years or over in certain representative schools for the deaf were reported as born deaf, and four-fifths were deaf before their 5th year, according to the National Research Council's report of its survey of schools for the deaf. Meningitis, scarlet fever, measles, falls and blows, and whooping cough are given as the chief causes of deafness which is not congenital."—*World's Children*, Children's Bureau, U. S. Dept. of Labor, July 3, 1928.

Speech Defects—Quoting from *Physical Education and School Hygiene Circular No. 12*:

Binet testing of children with speech defects in the St. Paul schools indicates that such children are neither duller nor brighter than other children. The median I.Q. for 402 children was 97.7—just average.

The percentage of children with each type of speech defect differs with the age groups. Letter substitution is found mainly in first and second grades. The percentage drops steadily until the junior-high-school age, when the defect is rarely found. Stuttering and stammering, on the other hand, are defects acquired, rather than lost, during the school career. It is practically the only defect at high school age.

There are about 400 pupils enrolled in the speech correction classes in a school population of about 40,000.—

Physical Education and School Hygiene Circular No. 12, U. S. Dept. of the Interior, May 7, 1928.

PUBLIC HEALTH NURSING

MIRIAM AMES, R. N.

The Heart Disease of Childhood—

Syphilis and senile degeneration are responsible for a large part of the heart disease appearing in adult cardiac clinics. Syphilitic heart disease is preventable if as soon as the disease is contracted treatment is instituted and continued.

The third largest group of patients have rheumatic heart disease. The last is essentially different from the first two forms, as the disease occurs almost exclusively in the first half of life. Because this is true, a very definite challenge to prevent rheumatic fever or its after-effects is offered to those interested in the care and well-being of children.

Until the exact nature of rheumatic fever is determined, at some future time, it would seem the safer plan to treat as one and the same condition the well-defined, clear-cut cases of rheumatic fever and the child who has growing pains, who is in poor health with recurring colds and sore throats, and who may or may not have signs of cardiac involvement.

The proper treatment and management of such children may do much to prevent the occurrence of rheumatic heart disease.

Every safeguard possible should be taken to lessen the strain on the heart of any child recovering from rheumatic fever or from any acute infectious disease. Children should not be allowed out of bed too early. The following points may make it easier to determine when the child may be permitted increased activities:

1. Normal body temperature for a week, not varying more than 1.5° F.
2. Maximum basal rate not more than 100 a minute
3. Return of pulse rate to previous resting basal rate within 3 minutes after exercise
4. Progressive gain in body weight
5. Absence of signs of fatigue, such as

- a. Lack of appetite
- b. Irritability in the late afternoon
- c. Delayed or restless sleep
6. Normal white blood cell count
7. Normal red blood cell count
8. Normal systolic blood pressure
9. Pulse pressure of 50 mm. or less
10. Heart size, stationary or decreasing
11. Normal cardiac mechanism
12. Absence of signs of heart failure
13. Normal respiratory vital capacity
14. Absence of skin eruptions
15. Absence of rheumatic nodules
16. Quiescence in infections of nose, throat or other foci
17. Period of normality for two weeks after withdrawal of salicylates.—

Rheumatic Heart Disease, by Hugh McCulloch, M.D., *J. A. M. A.*, 90, 26:2073 (June 30), 1928.

Deafness in Children—The infectious diseases are condemned as being responsible for many cases of acquired deafness. Records show that the most dangerous period of the development of deafness in children is before the 3rd year, that age when children are so apt to contract the familiar diseases of childhood.

In a group of over 1,000 deaf children, meningitis, scarlet fever, measles, influenza, infantile paralysis, and suppurative otitis media, were responsible for about 40 per cent of the cases. Infections of tonsils and adenoids, a factor in producing a mild deafness in children, are not regarded as being responsible for the production of deafness. Where deaf children have had tonsillectomies, the charitable view to take is that these were done not because of the deafness but because of the unhealthy condition of the adenoids and tonsils.

If the incidence of the infectious diseases is decreased, deafness in children

will be diminished to an appreciable extent with the accompanying economic and social gains. B. J. B.—Deafness in Children, *J. A. M. A.*, 90, 26:2104 (June 30), 1928.

New Things in Medicine—Is there “nothing new under the sun”? The old, familiar quotation answers us in the negative. Yet the year 1927 brought about some notable discoveries in medicine. Among these are the successful treatment of paresis by inoculating the patient with malaria. The fever thereby induced can destroy the paresis germ, and the malaria may then be cured by quinine. An apparently crystalline form of insulin was produced. The drug “myrtilin” was announced to be a treatment of diabetes. An antitoxin to cure erysipelas was developed.

Pernicious anemia is no longer the hopeless disease it was once, since the effectiveness of the Minot and Murphy liver diet has been demonstrated.

A diet for treating epileptic children has been found.

Another weapon against rickets in babies was discovered in the use of dried milk treated with ultra-violet light.

The good work is still going on. What will 1928 bring forth?—*New Things in Medicine*, *Ohio Health News*, 6, 13:4 (July 1), 1928. B. J. B.

What Next?—The death rate of women in childbirth can be lowered; the death rate of infants can be reduced. That the Sheppard-Towner Act has brought about these results is the conclusion drawn by the American Child Health Association and the Maternity Center Association from a study made by them at the request of the League of Women Voters to evaluate the accomplishments made under the Maternity and Infancy Act.

The maternal death rate for the

country *as a whole* has not changed appreciably in 1926 from that in 1922 when the act was inaugurated. However, during that period, the maternal death rates in the country districts have diminished; those in the city have increased. As most of the Sheppard-Towner money has been spent in rural districts, it is but fair to assume that it is in some measure responsible for the reduction.

Among the direct results of the bill may be numbered the formation of child hygiene bureaus in many states which previously had none, the establishment of permanent health centers, and the distribution of literature. Work is varied according to the needs of the state; for example, in Minnesota the Indians have received a much needed service from trained Indian nurses; child health conferences were conducted by physicians for Indian children. In Pennsylvania where large numbers of foreign born women demand delivery service by women rather than men, instruction has been given to midwives.

Such widespread activities must arouse interest in what is being done and what remains to be done. If the Sheppard-Towner Act has done nothing else, it has increased interest in maternal and in infant welfare.

The work is not completed. Many communities yet need to be shown by demonstration the reasonable standard of care for mothers and their babies. The effective methods of education must be made available through more and still more health centers and through conferences. The Sheppard-Towner funds will no longer be available after June 30, 1929.

What will then be the country's response so that the thousands of mothers yet unreached may receive the instruction and help they need?—The States Account for Their Stewardship, *Child Health Bull.*, 4, 3 (May), 1928.

Independence Assurance—Every professional self-supporting woman likes to feel that she will be able to continue to support herself regardless of advancing years. Life insurance can make this independence possible.

In considering the best form of life insurance for them, nurses may be divided into three groups: the nurse who does not have to support herself entirely, the one who supports herself and contributes to the support of others, and the nurse who has only herself to consider.

In the first case, the necessity of life insurance as a means of independence assurance is, obviously, slight.

In the second case, the nurse needs to consider the loss of income to her dependents through her death or loss of earning capacity. For her, many plans are possible, depending on the purpose to be served. If the largest amount of insurance at the minimum expense is desired, ordinary life insurance best fills the need. This guarantees an estate at the time of death, larger than any other contract carrying the same premium deposits. It is possible by the payment of slight additional premiums to have double indemnity if the insured is killed by accident. Likewise, an increased premium may pay for financial assistance if total or permanent disability should occur. Certain other desirable features are obtainable.

In those cases where the beneficiaries are only partly dependent for support on the one insured, the nurse might find it more advantageous to assume that form of contract which gives herself more return, such as a long-term endowment policy or one affording life income payments.

The nurse having only herself to look out for may find a series of endowment policies maturing at different times an exceedingly satisfactory way of insuring

independence in her later years, as well as providing funds for travel or other purposes. A retirement annuity, designed particularly for professional people, guarantees the payment of a monthly income when a certain age is reached.

It is only possible to indicate some of the ways in which a nurse may anticipate her future needs. Any representative of the insurance world would be ready to find the form of insurance best adapted to the personal needs of every nurse.—Charles J. Fay, *Insurance for Nurses*, *Am. J. Nurse*, 28, 6:579 (June), 1928.

Each Kind Necessary—"There are three kinds of public health work," said Sir Arthur Newsholme. "There is *first*, the old-fashioned public health work, for a large part of which we are immensely indebted to the engineering profession: the getting of a pure water supply, of adequate sewage and drainage, and the protection of food supplies. The stage of building up the sanitary regulations, generally defining such work has been gone through with. And these regulations need to be continued as much as ever.

"There is, *second*, the kind of public health work which views it with utmost importance that the consequences of physical defects be forestalled by their prevention and eradication in infancy and in early childhood.

"And, *lastly*, there is the form of public health work which recognizes it as a public duty that health protection and medical treatment be provided when persons needing such protection and treatment, or their families, are otherwise unable to secure it."—Sir Arthur Newsholme Revisits the New York Health Demonstrations, *Quarterly Bull. Milbank Memorial Fund*, VI, 3:54 (July), 1928.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

Wanted Before October, 1928— Outlines for the year's program of health organizations—local, state, national—public department or private agency—or outlines of specialized programs, such as, the inauguration of a new piece of work, diphtheria immunization, attendance at a clinic, vacation precautions, etc. Selections from the outlines submitted will be mimeographed and used in the discussion of "Steps in Preparing a Program of Health Education and Publicity," at Chicago in October.

The outlines should answer these questions:

1 Why will you undertake what you are planning? What facts, circumstances, or desires lead to the choice of activities?

2 What results are sought? What are the objectives or the responses hoped for?

3 To whom will you address the messages? What groups or kinds of people will you try to reach as being most important in getting the results wanted?

4 What is to be the message—the chief talking points—in each special activity?

5 How will you approach the selected groups or kinds of people? What do you believe to be their attitude toward the subject, and their understanding or lack of understanding of the subject? What motives, such as fear, the desire for good looks, civic pride, etc., will be appealed to in seeking action?

6 What are to be the methods and materials used in handling the several situations? List what you will do and what forms of publicity you will use. (A set of samples for display would be welcome.)

In addition to the above please list the routine activities, such as, day by day news which does not relate definitely to the program of effort for the year, the bulletin or house organ, giving out printed matter or information on request, etc.

7 Supplementing the above it will be useful to make up a calendar showing what is to be done month by month in both the preparation and carrying out of the publicity activities.

Recently several health and other social agencies have laid out their year's work according to the above outline. The results have been fairly startling. *We believe that you can do nothing more helpful in preparing for 1928-1929 than to make such an analysis of the plans for the year ahead.* If you cannot prepare a full statement, go as far as possible. Please send your outlines as early as possible to Mrs. Mary Swain Routzahn, 130 East 22nd Street, New York, N. Y. Will you drop a line stating that you are on the job?

Education and Publicity Headquarters at Chicago—The space allotted is bigger and better than we have ever had at the A.P.H.A. There will be room for consultation and conference, and the displays will have enough space so that they can be seen.

Division One: Ideas, methods and illustrative specimens—what to do and how to do it—ideas in the rough and ideas worked out in detail.

Division Two: Specimens of leaflets, folders, pamphlets, placards, posters, etc., etc. issued in 1927-1928 and choice specimens issued at any date.

The classification of the displays will be most satisfactory if the material is mounted, as noted below, except items that are too large or too heavy.

Heavy Kraft (brown wrapping) paper will be good for the purpose. Use one side of sheets cut not larger than 11 by 14 inches (11 being the width). Try to leave blank about 2 inches at the

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

left. If you get the sheets punched for binding have 3 holes, standard distance, at the left.

Every subject or method of use should be on a different sheet so that both the mounted and unmounted material may be classified after it reaches Chicago. Examples: Diphtheria, Colds, etc., etc., Annual Reports, Postal Cards, For Teachers, Mimeograph Work, Programs of Meetings, etc., etc.

If the name of the city and of the organization does not appear plainly on the material, please write, print or paste it at the top of every sheet. Explanation or comment, uses, number used, costs, etc., may be added where convenient by pasting a slip on the sheet.

All the items used in a campaign (newspaper, money raising, legislative, clinic attendance, etc.) may be grouped on several sheets with name of campaign at the top, or may be mounted in a binder.

In some cases, groups of closely related items could be mounted on cards not larger than 22 by 28 inches (22 being the width).

The headquarters display will also include helps in producing publicity material and information for those preparing publicity, which will be classified under such headings as: Paper, Printing, Statistics, Contests, Office, Exhibit Devices, etc., etc.

Items especially desired: the posters of the year; picture diagrams; organization charts; newspaper cartoons; photographs used in newspapers or printed matter; good newspaper stories; campaign outlines and handbooks; photographs or descriptions of stunts or features or window displays; examples of linoleum block illustrations, blue print process posters, soap sculpture; ideas, devices or materials which may be used in preparing exhibits or other publicity matter. Arrangements can be

made to show film slides and other projection material.

Send shipments *prepaid* to reach Chicago by Friday, October 12, and addressed to Evart G. Routzahn, Hotel Stevens, Chicago, Ill. Advance correspondence should be addressed to the above at 130 East 22d St., New York, N. Y. Material will be returned only if so requested in writing.

Join—or Get Them to Join—Before Chicago—The one professional organization for those doing any phase of public health education work or supervising such work is the Public Health Education Section of the A. P. H. A. The investment of the \$5 membership fee will mean far more to the health worker than to the A. P. H. A. which receives it. Why not canvass your staff for any who are at all concerned with any phase of education and publicity and invite them to join? Why not write to the health agencies in your city and state? The A. P. H. A. will gladly supply application blanks, but your letters need not wait for these. Write your first letters and if any do not respond, follow up with the blanks.

We All Take Part at Chicago—Luncheon sessions will be enriched by the ideas and experiences of many workers from all sections of the United States and Canada. Under "High Spots in 1927-1928," we hope to have time enough for quick reports of all the new ideas and successful methods, with mention of bright news stories, etc. We expect "Ray" and "Al" to demonstrate a duet on social hygiene before Kiwanis, and possibly others will have displays. What have you to offer? If, sadly enough, you cannot be at Chicago, please send samples or descriptions to be presented for you. In response to requests, one luncheon will show "Why Some of the Exhibits at the Convention

Are Good"—and possibly why some are not so good. What is new in "Diphtheria Campaigning" will follow up the Cincinnati session, when the audience was much too big for the meeting room. The "Program for Health Education Training in Teachers' Colleges" will be of significance to our educator members.

Getting Together at Chicago—The "live wires" in public health education and publicity will be largely represented at Chicago in October. The mere coming together of the supervisors and practitioners of successful publicity, even if there were no formal meetings, would make the trip well worth while. Ideas, experiences, questions as to how you did it, brief cases overflowing with samples, stimulating personalities—all will await your arrival at Chicago. And the Dinner-Business session of the Public Health Education Section, Tuesday night, will be the grand get together opportunity of the year.

What About the Audience?—We have seen the speaker whose face and manner made clear that he was almost unconscious of his audience as a group of people, and heard the speaker who reveals his ignorance of what the members of his audience know or feel about the subject. According to Bertram G. Nelson, University of Chicago, what you say depends on your estimate of the audience. Prof. Nelson, speaking of dental talks, says:

Bring them vividly before your mind. Ask yourself such questions as these: 1. Are they boys? Girls? A mixed group? 2. How old are they? 3. Have they any interest in teeth now? 4. Would a girl's interest in her teeth have the same basis as a boy's? 5. Have they had experience with dentists? 6. Do they like dentists? 7. What home training have they had in caring for their teeth? 8. Has the school taught them anything about their teeth? 9. How much can they receive in ten minutes? 10. What obstacles must be overcome? 11. Have they any prejudices that I need to overcome? 12. Has any other dentist

been there before me? If so, did he make a good or bad impression? 13. What are the fundamental facts that have a practical application for them?

Try talking about his teeth to the next high school boy that you meet. Don't begin by giving him good advice but question him. Find out at first-hand what boys of his age think about their teeth, and what care they give them. You will think this step is unnecessary and will try to remember what you thought and did at that age. Don't fool yourself. Talk directly to the present high school boy. Don't judge him by your own son or daughter. Your children were brought up in a home where toothbrushes were a religion. Talk to your boy's pal. Talk with several boys. After you have interviewed five or six boys and girls, notice how definite your image of that high school assembly has become. Already you begin to feel somewhat at home with it.

Do You "disseminate knowledge"?—"Briefly, the control of cancer depends mostly upon the dissemination of knowledge that will lead to its early recognition by the patient and the physician."—*Health*, New Hampshire State Board of Health. Are we disseminating knowledge, or handing out printed matter? There is often a difference.

To Prime the Pump—In the search for a title for a pamphlet the publicity worker of a national organization looked over a variety of folders and booklets. Then he wrote: "I found several suggestions which may prime the pump." The frequent collections of titles and other groups of material are given in this department largely to stir the imagination of alert workers—to stimulate thinking—to "prime the pump." Additions to these lists are always welcome.

ADDRESSES AND PRICES

To save space we do not give addresses or prices of periodicals with every reference. Usually this information will be given somewhere in the issue, except in the case of the most widely known publications. If not, it will be found in this department in a recent issue.

COÖPERATING GROUPS

Not long ago a high school wrote to the American Junior Red Cross: "Don't give us something to read; give us something to do." And it is "something to do" that will win for public health the active coöperation of millions of helpers—children, young people, grown-ups. *What do we offer them to do?* The editor of this department offers a very special prize for the "best" list of services asked of non-health groups which is submitted before the Annual Meeting in Chicago.

If Rotary, or any club or school group you wish to interest gets out an illustrated year book, tell them of Warren's Year Book Portfolio with its very practical suggestions for business manager and editor. It is good also because of its layout suggestions, for any group which issues an annual report or other publication containing many pictures of clubs or other groups. S. D. Warren Co., 101 Milk St., Boston. *Free.*

Fifteen luncheon clubs will be addressed by representatives of the American Dental Association during the August meeting in Minneapolis, Minn.

"Women's Clubs and State Health Program" is a news release of Illinois Department of Public Health. Tells of help given by various coöperating groups.

HOUSE ORGANS

Child Health Bulletin, American Child Health Association, gives two interesting forms of diagram to show when babies die, and the main causes of their death.

The Commonhealth, Massachusetts Department of Public Health, describes the "teacher's own health score card," prepared by a committee of the Massachusetts Teachers' Federation.

Health, New Haven Department of Health, gave a page for the New Haven

Library to tell about the "readable books for the laymen" that are available.

The Health Bulletin, North Carolina State Board of Health, is quoting liberally from current newspapers and other periodicals, sometimes with snappy localized comment.

The Health Messenger, is a 16-page monthly now issued by the Public Health League of Washington, 907 Medical and Dental Bldg., Seattle, Wash.

Social Hygiene News, American Social Hygiene Association, outlined the work of the Division of Public Information and Division of Educational Measures in its March 30 issue.

A dainty valentine design on the cover page of the last February number of *Better Health*, Department of Health, Syracuse, N. Y., enclosed these words: "Mother Dear—If you love me as you say you do, please have a health examination every year and see to it that I have one also. Don't let Dad forget his examination either. Your Valentine."

Two new periodicals are announced in a recent issue of one of the especially helpful magazines for health workers, but no addresses are given!

"Popular Health Education in the Orient," by Dr. F. Humbert. *Worlds Health*, Dec., 1927. Brief reviews with illustrations. "The fundamental principles of popular health education being one and the same, variations of local details are of no more importance than the color of the clothing or skins of natives."

Health Bulletins for the people—We have received several bulletins from an eastern city which are illustrated by an exuberant cartoonist and written by a deadly serious health officer. If they could meet half way—or still better, get together on the premises of the artist, the everyday people for whom they are intended would learn more.

LAW AND LEGISLATION

JAMES A. TOBEY, LL. B., DR. P. H.

WITH Congress in adjournment, the Supreme Court in recess, and the executive branches of the Government subject to the somewhat enervating summer climate of Washington, there has been a vacuity of items on public health law from the national capital. Not so in the states, however, as the following items from Indiana, Massachusetts, Georgia, Missouri, Wisconsin, New York and Virginia will show.

A City Pays for Stream Pollution—It has cost the City of Frankfort, Ind., damages amounting to \$3,962.07 for polluting a stream with sewage and thus causing injury to an individual property owner. A decision upholding such an award by a lower court was handed down by the Appellate Court of Indiana on June 19, 1928, according to the *Monthly Bulletin* of the Indiana State Board of Health. In this case, *City of Frankfort v. Slipper*,—Ind.—the city attempted to show that since it was authorized by statute to build and maintain sewers, it could also lawfully discharge its sewage without purification into a stream which is the natural outlet, and that there could be no liability from such action. The court, in an able opinion, declared:

The rule of necessity thus declared must in and of itself inevitably force just the opposite doctrine, in the interest of the public health, the very thing supposed to be subserved by the rule, when it is daily becoming more and more apparent that the sewage in the streams is a real menace to the public health, and it is not a necessity, because it can be otherwise provided for, with practicability and assured safety to the public health.

A violation of the Federal Oil Pollution Act by a steamship captain on the Taunton River near Fall River drew a

fine of \$500 imposed on June 1, 1928, by a United States District Court in Massachusetts, according to an article by Dr. George W. Field in *Our Dumb Animals* for July, 1928. Dr. Field writes that the judge in this case "rendered a distinctly notable service to humanity and to the world in general."

Another Milk Ordinance Upheld—The Supreme Court of Georgia is the latest of the state courts of last resort to sustain a city ordinance for the sanitary control of milk. On May 5, 1927, this court, in the case of *Leontas v. City of Savannah*, 138 S. E. 154, construed the milk ordinance of that municipality, but did not actually pass upon its constitutionality. On April 16, 1928, this same court handed down an opinion in the case of *Leontas v. Walker*, 142 S. E. 891, in which the constitutionality of the ordinance was upheld.

The facts in this case are rather unusual. Leontas, a dairyman, was indicted for involuntary manslaughter because of the death of a person who drank chocolate milk containing condemned milk from the Leontas dairy. The indictment alleged that Leontas was engaged in an unlawful act, violation of the city milk ordinance, when the death occurred. Leontas was thereupon bonded to appear for trial, but went to Europe. His attorneys came to court and attempted to file a demurrer to the indictment, alleging among other things that the ordinance in question was unconstitutional, but Leontas not being present, the court refused to accept it, and later ordered payment on the bond. Leontas appealed.

The Supreme Court merely held that the ordinance was not inconsistent with

the constitution of the state, saying, "The power to 'regulate' the sale of milk includes the power to 'prohibit' the sale of impure milk as referred to in the ordinance; so that, in substance, the ordinance only involves one subject matter."

In New York, a judge of the Court of Special Sessions, one of the lower courts, has held unconstitutional a regulation of the New York City Sanitary Code which prohibits possession of a churn or other device for treating milk, without a permit from the Board of Health. This regulation was held to be unreasonable, because it is the *use* and not mere possession which might be dangerous. *People v. Schneider, et al.*

A Real Guide for Health Officers

—A number of unique and particularly valuable features characterize the *Health Officer's Guide* recently issued by the State Board of Health of Wisconsin, where Dr. C. A. Harper is State Health Officer. Not only does this booklet reproduce accurately the state laws on all phases of public health, but it also contains opinions of the Attorney General, abstracts of court decisions pertaining to public health from many states, and discussions of the legal aspects of various health subjects.

The laws, which comprise the latter half of the book, are printed directly from the same plates used for the state code. While this plan causes the page numbers to be peculiar, this slight disadvantage is more than offset by the fact that the laws are given correctly, which is more than can be said for many pamphlet compilations of laws prepared by state health departments.

Since other states may contemplate the issuance or revision of similar booklets, a few constructive suggestions may be in order. The opinions of the Attorney General are presented here in the middle of the book, with apparently no

special arrangement. An endeavor should be made to key such opinions to the laws to which they refer. Many of the court decisions have no references at all, and none has more than one citation. The value of these abstracts would be greatly enhanced if dates of the cases were given, together with complete references to all law reporters where the cases may be read in full. Consultation of the table of nearly 500 cases in the book, *Public Health Law*, shows that there are at least three references each for most of the decisions listed. The cases in the Wisconsin pamphlet might also be arranged in a more logical sequence.

Among the other useful material in this health officer's guide are descriptions of the functions of the divisions of the state board of health, discussion of the organization and duties of local health authorities, suggestions for local action, model ordinances and local sanitary regulations, and the rules and regulations of the state board. Although there is a good index, a table of contents would also have been valuable. The arrangement of topics might also be better.

Although a few opportunities for improvement have been pointed out, the general idea and execution of this guide is excellent, and it is a work which should be of great value to health officials in Wisconsin, and of interest to sanitarians in administrative capacities in other states.

The Buzz Saw—"Don't monkey with the buzz saw," says Pennsylvania's *Health* for July-August, 1928, in reporting that a citizen of that state was recently prosecuted and convicted for permitting her children to be on the public highway after the premises had been quarantined for scarlet fever. She had the further honor of policemen at her front door to see that the quarantine was observed.

A similar incident occurred recently in New York, according to an editorial printed on July 3, 1928 in the *New York Sun*, which frequently comments in a progressive manner on public health matters. A man who had smallpox took an automobile ride. It cost him \$100 fine for his folly. Another person quarantined for smallpox decided to wander away, but when he was found he was arrested, convicted, and permitted to languish in jail for 30 days. "The health officers mean business when they impose quarantine," says the *Sun*. "They do not play with death. The public they seek to protect from its own recklessness and lack of information should learn to obey their orders." Good advice!

Virginia Also Takes Action—Mr. Routsahn has passed on to this department a mimeographed news release from an unknown source, dated July 6, 1928, which states that a prominent physician of Charlottesville, Va., has been fined \$25 for failing to put nitrate of silver drops in the eyes of an infant whose birth he recently attended. The child developed an eye infection, though blindness was averted by prompt medical care by other physicians. It is said that the parents of the child contemplate an action for damages. All this is hearsay, but it emphasizes the good advice, "Don't monkey with the buzz saw of public health."

A reprint from the *Southern Medical Journal* for June, 1928, entitled "Public Health Administration in Virginia," which contains no hearsay, but a number of solid facts, will be sent by the Associate Editor, or by Dr. E. G. Williams, State Health Commissioner, Richmond, Va., to anyone who cares to have it.

"Court Work" and Venereal Diseases—In New York City all women who have been convicted of street walking are referred to the Department of

Health for examination by a physician. Those found infected are sent to a hospital, though old offenders and recidivists go to the workhouse. During 1927, a total of 2,481 such persons were examined and 1,190, or 48 per cent, were found infected, according to an item in the *Weekly Bulletin* of the New York City Department of Health for May 26, 1928.

"Menace of the Half Man"—Judge Harry Olson of the Municipal Court of Chicago contributed a brilliant paper on crime and mentality before the Third Race Betterment Conference at Battle Creek, Mich., last winter. An abbreviated report of this address is presented in *Good Health* for July, 1928, and should be read by all persons interested in this important subject.

Judge Olson points out that defects of the emotions are conspicuous to a remarkable degree among the unreformable and dangerous criminals. He describes the psychopathic clinic connected with the Boys' Court in Chicago, to which judges send suspected cases of mental defect. Out of 779 such cases, 654 were found to be suffering from dementia praecox, 109 from psychopathic constitution, and 10 from epilepsy. Dementia praecox was also discovered to be the leading criminal psychosis among persons brought before the Morals Court and the Domestic Relations Court.

One solution proposed by Judge Olson to the problem is to give psychiatric examinations to all school children, so that defectives may be identified and the unreformable type segregated. In order to do this, however, many more experts are needed.

Infantile Paralysis Delays a Trial—A man charged with unlawful possession of intoxicating beverages applied for a writ of habeas corpus on the ground that he had not been given a

speedy trial. The writ was denied because it was shown that there was an epidemic of infantile paralysis in the town where the court sessions were held and therefore a delay of more than 60 days was excusable. This is a California case, *Ex parte Venable*, 261 Pac. 731.

Report Births or Be Fined—Missouri was admitted to the birth registration area in September, 1927. Since that time 2 physicians to whom this fact apparently meant nothing, have had the pleasure of paying fines for failing to comply with the state law on vital statistics, according to an item in the *Journal of the American Medical Association* for July 21, 1928.

Miscellaneous Items—An International Conference on the Safety of Life at Sea will be held in London in the spring of 1929 to bring up to date the 1914 convention.

A survey of public health administration in the District of Columbia has recently been completed by the U. S. Public Health Service. The local health department is said to be "inadequate and ineffective in many of its component activities."

Cuba has a new law imposing a tax on luxuries, the revenue of which will go to tuberculosis hospitals and other public welfare institutions.

Health work in Soviet Russia is described in the *Monthly Labor Review* of the U. S. Department of Labor for July, 1928, the article being a lengthy review of a recent book on this subject by Anna J. Haines.

A Florida law for the regulation of the practice of pharmacy, which is now under the supervision of the State Board of Health, is given in the *Health Notes* of Florida for July, 1928.

The police power is the subject of an interesting article by L. P. Stryker in the *New York State Journal of Medi-*

cine for July 15, 1928. Mr. Stryker, who is counsel of the medical society, is contributing a series of articles in the legal department of this magazine.

CONFERENCES

September 12-14, Southern Conference of Tuberculosis Secretaries, Biloxi, Miss.

September 17-19, Mississippi Valley Conference on Tuberculosis, Des Moines, Ia.

September 18-21, New England Water Works Association, Montreal, Can.

September 24, 25, 26, New England Health Institute, Burlington, Vt.

September 25, 26, Annual Conference of Indiana State Health Officers, Gary, Ind.

September 25, 28, American Roentgen Society, Kansas City, Mo.

October 1-5, National Safety Council, New York, N. Y.

October 4-6, Association of Military Surgeons of the United States, Baltimore, Md.

October 11-13, Fall Regional Social Hygiene Conference, Louisville, Ky.

October 11-13, Canadian Public Health Association, Winnipeg, Can.

October 11-13, International Association of Dairy and Milk Inspectors, Chicago, Ill.

October 15-19, American Child Health Association, Chicago, Ill.

October 15-19, American Social Hygiene Association, Chicago, Ill.

October 15-19, State Health Officers of Illinois, Chicago, Ill.

October 15-19, American Public Health Association, Chicago, Ill.

FOREIGN

October 29-November 1, Second International Conference on Light and Heat in Medicine, Surgery and Public Health, London, England.

December 28, International Congress of Tropical Medicine and Hygiene, Cairo, Egypt.

BOOKS AND REPORTS

Publicity for Social Work—By *Mary Swain Routzahn and Ewart G. Routzahn*. New York: Russell Sage Foundation, 1928. 392 pages. Price, \$3.00.

Publicity is an essential aspect of successful social work. Whether one considers securing financial support for an organization, creating public demand for better social legislation, arousing sentiment against undesirable social conditions, or persuading the individual to "Cross Crossings Cautiously," the weapon upon which success depends is publicity. This volume is a manual of publicity technic.

The authors admit that they had expected to be able, after their detailed examination of publicity programs in many organizations and communities, to indicate the fundamental principles of successful publicity. Their studies, however, revealed the fact that there is no commonly recognized or scientifically organized technic for publicity among social service agencies. This treatment, accordingly, undertakes to set forth as an integral part of its analysis the psychological principles underlying effective publicity. Throughout the text the authors bring, from a wide scope of material, the findings of technical research and scientific investigations.

The discussion is by no means theoretical, however, for it keeps close to the material afforded by the experience of actual organizations. Such topics as "Social Work and the Newspaper," "Printed Matter," "Meetings," "Dramatic Methods," "The Intensive Campaign," suggest the range of interest.

The psychological and educational material is sound and to the point. The problems discussed are practical, and there is a wealth of valuable detail. An abundance of illustrative material from

widely varied sources lends both interest and concreteness. The book represents a genuine contribution to the field.

FORREST WITCRAFT

The Newer Knowledge of Bacteriology and Immunology—*Edited by Edwin O. Jordan and I. S. Falk*. Chicago: University of Chicago Press, 1928. 1196 pp. Price, \$10.00.

This book does not purport to be a text, nor yet a comprehensive survey of the whole field. It is "an attempt to make the latest results of investigation in various lines of bacteriology and immunity available for students and active workers." The editors state that it is their hope that the book will serve to promote research both by furnishing landmarks of progress and by affording suggestions on significant unsolved problems. The book partakes of the nature of a symposium, a type of work quite popular at present. The first portion is largely devoted to bacteriological matters and the latter portion to immunology.

So far as suggestiveness is concerned those chapters on immunological subjects are distinctly more stimulating to the worker and come more nearly to filling the claims of the editors than the chapters on bacteriology. The former are often mere reviews, largely of a text-book nature, only a relatively small portion of the material being "newer." In approximately one-third of the book there are more than a hundred references to literature prior to 1900. Inasmuch as the book is inconveniently large, much of the older material, which may be found in standard texts, might well have been omitted. Certain chapters might also have been combined without appreciable loss to the value of

the book—for example, I on morphology and IV on morphological changes during growth, V on growth curves and VI on the rise and fall of bacterial populations, XXIII on soil microorganisms and XXVI on the relation of organisms to soil fertility, and several others. Other chapters have little relation to the title or the subject, such as XXXIII, which, though excellent, treats entirely of the mechanical aspects of pasteurization.

Perhaps the chapters of most value to the worker in pure bacteriology are those which seem to have least connection. Chapters XII on oxidation-reduction potentials, XLI, which treats of the general aspects of filterability, and X on atoms, ions, salts, and surfaces contain information which, though not in itself especially new, is important since the recognition of such subjects as affecting bacteriology is not of long standing.

Certain chapters might well be omitted. Chapter XXX on bacteria in milk is largely the history of the confusion in nomenclature of certain milk organisms. In reading chapter XXXI on bacteria in dairy products, which is filled with general non-technical information, one gets the feeling of being superficially escorted through an industrial plant, or in reading chapter XXXIV on foods, one is reminded of the advice of a retained technical expert to a layman.

Certain chapters are stimulating and give specific suggestions for handling problems. Especially so are Norton's two chapters on water bacteriology and on the action of ultra-violet, and Tanner's chapter on yeasts. On the other hand, one reads too often statements similar to that of Kahn on page 857: "numerous problems in connection with the nature of the reaction are yet to be solved," though the nature of such problems is not disclosed.

Two or three points of confusion which have been rather common in recent literature have been retained in

the book. In at least two places (pages 19 and 1115) the authors confuse pH with acidic or basic properties of a compound. This confusion seems much more general than it should be and often leads to misconceptions and misinterpretation both of one's own data and of published results. Physical units are at times confused, as on page 373, where energy is expressed in watts.

The book has several rather serious omissions for a work of its claims. There is practically nothing included on cytological problems. A reading of chapter VII will indicate the importance of cytology, an aspect in which modern researches on dissociation have stimulated renewed interest. Despite the personal opinion of an author regarding receptor analysis, it should certainly be given more than simple mention.

In several places the reviews do not seem quite up to date. Two cases are the omission of reference to the theory of fermentation of A. L. Raymond (*Proc. Natl. Acad. Sci.*, 11: 622, 1925) in connection with a discussion of theories of fermentation in chapter XVI, and omission from chapter XI of mention of the important work of Gibbs, Batchelor and Sickels (*J. Bact.* 11: 393, 1926), on the effect of surface tension on bacterial growth—a piece of work which leads to conclusions not in accord with those given by the author of this chapter in his own work. One can hardly accept the statement in this chapter that if union between toxin and soap is chemical, "all toxins reacting with a given soap would necessarily be considered identical chemically."

On page 303, the footnote is in error. These methods were not officially approved by the Laboratory Section of the American Public Health Association, and the Standard Methods Committee is not authorized to approve such procedures; therefore the statement that such approval was given is an error.

There is great lack of uniformity in structure of chapters, not only in the text but also in the references. The name is not quite broad enough to cover the subject matter treated since there are chapters on yeasts and molds and protozoa. Many of the chapters one would wish to have available, but one might not wish to be forced to acquire the entire book for those chapters, especially since more than a few have such similarity of structure and content to single articles or books by the same authors, that reprints would serve the same purpose and be less unwieldy to use. A proper grouping of the chapters into several volumes which might be purchased separately would be an improvement.

As a whole, the book is exceptionally free from typographical errors. The only one noted which is likely to be taken as an error of text is a sign of one of the values for free energy change on page 324.

M. P. RAVENEL

Proceedings of the Tenth Texas Water Works Short School—Austin, Tex.: Texas Section of the Southwest Water Works Assn., 1928. 300 pp. Price, \$1.00. 40 per cent off on 10 or more copies.

The volume is divided into two sections, one devoted to Water and the other to Sewage and covers 294 pages. The two subjects are rather fully gone into, considering that the material was prepared for a 4-day program which had to represent the varied interests of the water and sewage plant operators in Texas. The papers were prepared by some of the foremost men in their respective fields in America and foreign countries.

H. W. Streeter of the U. S. Public Health Service discusses filter plant loadings and stream pollution; microscopic life in water is treated by Dr. Asa Chandler of the Rice Institute, Houston,

Tex.; Dr. Karl Imhoff tells how he calculates the capacity of sludge digestion tanks; Arthur J. Martin, consulting engineer of London, discusses activated sludge problems from the English standpoint; while G. L. Fugate and J. C. McVea, engineers of Houston, Tex., disclose some of the secrets of a successful activated sludge plant in Texas as exhibited by the Houston installation. Dr. Willem Rudolfs, of New Jersey Experiment Station fame, points the way toward a comprehensive sewage research program for Texas.

The special water problems of Waco and St. Louis are discussed by a water superintendent and a water commissioner, respectively, who have had charge of their plants for a number of years. Some of the recently installed and especially interesting sewage plants are described and illustrated, including that at Fort Worth, Houston, Jacksonville, and Waco.

E. G. EGGERT

Water Purification—By Joseph W. Ellms, (2d ed.) New York: McGraw-Hill, 1928. 594 pp. Price, \$7.00.

It is somewhat over ten years since the first edition of this important volume was issued by Mr. Ellms. At the time of its first appearance it contained approximately 485 pages of an excellent summary of water purification practices and devices, as of that date. It was written in simple style, reasonably well illustrated and with presentation of tabular and graphical material, helpful to the general, as well as to the technical, reader.

The second edition, as well as the first, contains information of value to the public health profession. It reviews the classification of natural waters, the principles of transmission of disease through drinking water, the effect of improved water supplies upon health and the detailed procedures and mechanisms of treatment by which the removal of

various objectionable constituents is accomplished. It has been and should continue to be one of the few modern authoritative and fairly comprehensive texts on water supply treatment.

The reviewer is somewhat in doubt as to whether the volume in hand may be logically designated as a second edition. After careful survey of its contents, one finds that it is virtually the first edition repeated verbatim with additions almost entirely restricted to new bibliography, photographs and short portions of new text inserted *bodily* within the old, and frequently merely added to existing, chapters. New material is presented on the strainer systems of filtration plants, mixing devices prior to coagulation, the manufacture of aluminum sulphate, discussions of motors, efficiency and cost of operation of rapid sand filters, the effect of hydrogen-ion concentration of natural waters (a new chapter), on disinfection of water (in some minor additions to the chapters), the application of iodides in the treatment of water (one page), and in the amplification of discussion on water softening, boiler compounds, recarbonation and iron removal. The additions are of interest and helpful, but their introduction into the bodies of the text, frequently without any adjustment of previous text, leaves something to be desired.

The issuance of a second edition in the form followed in this case leads to some disconcerting inconsistencies, as, for example, in Chapter 29, page 451, where it is stated that "Chlorine or the hypochlorites are, therefore, merely agents for the production of oxygen under conditions which render it extremely active." Somewhat the opposite conclusion is indicated on page 480, in Chapter 30, where at least some doubt is indicated as to the oxidation effect of chlorine compounds in disinfection and otherwise. The inconsistency probably

has its origin in the fact that the earlier chapter has undergone virtually no changes in language over the edition of 1917. The same criticism applies to the bulk of the present edition.

Unfortunately some of the typographical errors of the first edition are carefully repeated in the second.

Although approximately 17 pages are devoted to power plant pumping machinery, etc., in Chapter 23, the wisdom of including such material in this text is debatable. It is hardly possible to devote sufficient space to the topics included therein to make them either authoritative or comprehensive. The discussion in two pages of motors for centrifugal pumps hardly does justice either to the subject matter or to the author.

The text still represents one of the most valuable sources of reference for information on water purification practice. The criticisms do not refer primarily to the fact that the second edition has made the first less helpful, but that it might have made it more helpful, with more complete revision of text. It is possible, for instance, that the discussion of the state of the art in ozone, ultra-violet light and algicide treatment does not require any change in a text 10 years old, in order to give an accurate picture of present-day practice, but the reviewer has some doubt about it.

ABEL WOLMAN

Heredity and Human Affairs—By Edward M. East. New York: Scribner, 1928. 325 pp. Price, \$3.50.

Professor East is not only an authority on the phenomena of heredity and genetics, but a thinker with a clear insight into the significances of investigations in this important field and a writer with a facile pen, some knowledge of literature, and a sense of humor. His latest book dealing with heredity in relation to human traits and human problems is therefore authoritative, up-to-

date, very lucidly written and withal quite entertaining.

Among his chapters are those dealing with the grammar of heredity; heredity and sex; inheritance of human traits; heredity and environment; marriage between near kin; racial traits; race problems; genius; mediocrity, and education; the lower levels of humanity; the survival of the underman; and immigration.

His advice on cousin marriages is caution, because of the prevalence of objectionable recessive traits, particularly defective conditions of the nervous system, in man. Inspection of family histories is advised before such marriages.

In matters of education, he pleads for more attention to, and more expenditure on the more intelligent child, and for better teachers. Segregation and sterilization are the effective means of restricting the increase of the worst types of human defectives, but much may be done with the higher grades of defectives, the morons, the neurotics and the intermittently insane, by educational measures. Dr. East is not sanguine that social inadequacy will ever be eliminated by any combination of eugenics and euthenics, but does suggest that the disastrous results of a bad heredity combined with a bad environment may be mitigated by the panaceas dear to the heart of the social worker.

He is less optimistic than Pearl with regard to the effect of the declining birth rate of the professional and related occupational classes in our population. East points out that superiority is not the result of mutations, but is rather due to fortunate combinations of desirable genes. Eugenics and genetics are not all "blather." The extinction of families supplying such genes in larger proportion will have its effect in time.

Immigration in recent years has tended to lower the quality of the national stock. When forced by economic

necessity it tends to lower the biological quality of the race and immigrant competition tends to sterilize the native population.

The relation of the unintelligent to art, science, and civilization is seen in anti-evolution agitation, anti-vaccination propaganda, and anti-vivisection societies. "Science will be hounded, coerced, and suppressed, possibly destroyed" by such agencies. Social reforms are not panaceas. The epigram of the London *Spectator* on the "Modern World" is in point:

Science finds out ingenious ways to kill
Strong men, and keep alive the weak and ill—

That these a sickly progeny may breed,
Too poor to tax, too numerous to feed.

Genetics gives fair warning to the sensible that civilization is in a dangerous situation, for which only one remedy is specific. CHARLES A. KOFOID

School Posture and Seating—A Manual for Teachers, Physical Directors and School Officials. By Henry Eastman Bennett, Ph.D. New York: Ginn, 1928. 320 pp. Price, \$2.00.

This book is a combination of a discussion of posture from an anatomical and a physiological point of view, a report of a study of sitting posture of school children and a description of a method by which the author has arrived at his conclusions of what constitutes a proper school seat.

All three parts are treated scientifically, with the possible exception of the study of the posture of school children where the objectivity of the author's tests might be questioned. There is no doubt that a chair in which a school child can sit correctly is important; but this importance seems a bit over-emphasized in the discussions on the results of bad posture. The appearance of our "girl graduates" each June suggests an exaggeration in the following statement: "The universal occupation of girlhood

is 'going to school'; and here, despite the insistent reiteration of school hygienists, despite the fact that posture habits established in this formative period almost inevitably affect the whole future physical life, figures prove posture to be extremely bad."—and can we rely absolutely upon these figures? And still again there is no proof that school sitting posture permanently affects the habitual posture of children.

Modern practices in education give much more freedom in the schoolroom than formerly, and children do not sit in one seat for long periods of time. And again, flexibility of the spine and general muscle tone have more to do with habitual posture than the chairs on which we sit.

The book as a whole is a very valuable contribution to the subject of posture, and Mr. Bennett takes a broad view, but it must be kept in mind that posture is a complicated subject with no evidence as yet by which we can determine whether it is a cause or a result of many of the disorders discussed in this book. The type of seat described in detail coincides with studies made by the American Posture League and all who have responsibility in the seating of school children should read this book.

ETHEL PERRIN

Proceedings of Fifth Annual Short School, Texas Association of Sanitarians—*Houston, Tex., Nov. 1-4, 1927.* 136 pp. Price, \$1.00.

This pamphlet containing 144 pages is divided into six sections. The first covers numerous questions, among which might be mentioned discussions of the field of non-medical sanitarians, Texas schools and sanitation; practical epidemiology, railroad safety campaigns and housing.

The second section is devoted entirely to milk sanitation. The status of this work in Texas and Louisiana is dis-

cussed. Bacteriological tests of water and algae are treated in the third or laboratory section, while section 4 covers sewage disposal and related subjects like privies, septic tanks and stream pollution.

Section 5 is devoted to mosquito control and means for financing such work. The proceedings and minutes of the meeting are contained in the last section.

ARTHUR P. MILLER

A Sound Economic Basis for Schools of Nursing and Other Addresses—*By Mary Adelaide Nutting, R.N., M.A. Putnam, 1926.* 372 pp. Price, \$2.50.

In a series of published addresses given at various times over a period of 22 years, Miss Nutting presents much of the history of the struggles to provide the sick with better nursing care through the advancement of education for nurses. These addresses are now collected in one volume.

Anyone reading this book cannot but be impressed by the sympathetic way in which the problems are treated; by the rare and deep compassion for the sick and a firmly rooted desire to provide them with intelligent, skilled, efficient care; sympathy for the administrative officers of the hospital; and understanding of the difficulties of the graduates who are unprepared many times for the wider fields of professional life, entering, as they do, into every level of society.

The establishment of the proper relationship of the hospital to the school of nursing is stressed. The latter should exist solely for the purpose of educating the nurse. Trustees or managers willing to accept the responsibility of providing funds for maintenance and for its growth and development, should be vested with the power to control and manage the school.

To the ever-present urgent problem of

financing the schools is apportioned much space. Three ways of securing funds are offered for consideration; namely, through public funds derived from taxation, private funds by gifts, and fees from students.

The ideal school of the future will have university affiliation; endowment fees paid by the students with liberal provision for scholarships and local funds for those who are unable to meet expenses; a shorter course for college graduates; high entrance requirements; sound instruction in the preliminary sciences; adequate libraries and equipment; shorter hours on duty; time for rest and vacation; more capable paid

teachers, and self-imposed discipline. The endowment can provide for all, but in order to secure endowment funds the public must first be acquainted with the real need of the school.

A wealth of experience in educational and administrative fields qualifies the distinguished author to speak authoritatively on questions relating to the present inability of schools to advance to a place where nursing education is comparable to that which is offered in other professional schools.

The book amply substantiates the arguments in favor of the fundamental need of the schools of nursing.

MIRIAM AMES

BOOKS RECEIVED

THE CARE OF THE PATIENT. By Francis Weld Peabody. Cambridge: Harvard University Press, 1928. 48 pp. Price, \$1.00.

HOSPITAL ORGANIZATION AND MANAGEMENT. By Capt. J. E. Stone. London: Faber & Gwyer, 1927. 642 pp. Price, \$6.50.

COLLEGE TEXTBOOK OF HYGIENE. By Dean Franklin Smiley and Adrian Gordon Gould. New York: Macmillan, 1928. 333 pp. Price, \$2.00.

FUNDAMENTAL GYMNASTICS. The Basis of Rational Physical Development. By Niels Bukh. New York: Dutton, 1928. 202 pp. Price, \$2.00.

FOOD PRODUCTS, THEIR SOURCE, CHEMISTRY AND USE (3rd rev. ed.). By E. H. S. Bailey and Herbert S. Bailey. Philadelphia: Blakiston, 1928. 563 pp. Price, \$2.50.

HOW YOU CAN KEEP HAPPY. By Wm. S. Sadler. Chicago: American Health Book Concern, 1926. 292 pp. Price, \$3.00.

DICTIONARY OF AMERICAN MEDICAL BIOGRAPHY. By Howard A. Kelly and Walter L. Burrage. New York: Appleton, 1928. 1364 pp. Price, \$12.00.

THE OPIUM PROBLEM. By Charles E. Terry, M.D. and Mildred Pellens, for Committee on Drug Addictions. New York: The Bureau of Social Hygiene, 1928. 1042 pp.

GOITER PREVENTION AND THYROID PROTECTION. By Israel Bram, M.D. Philadelphia: Davis, 1928. 327 pp. Price, \$3.50.

OBSTETRICAL NURSING (2nd ed. rev.). By Carolyn Conant Van Blarcom. New York: Macmillan, 1928. 575 pp. Price, \$3.00.

A MANUAL OF TUBERCULOSIS LEGISLATION. By James A. Tobey. New York: National

Tuberculosis Association, 1928. 86 pp. Price, \$.50.

INFANCY AND HUMAN GROWTH. By Arnold Gesell. New York: Macmillan, 1928. 418 pp. Price, \$3.50.

PRESCRIBING OCCUPATIONAL THERAPY. By William Rush Dunton, Jr. Springfield, Ill.: Charles C. Thomas, 1928. 142 pp. Price, Cloth, \$2.10, Paper, \$1.35.

STORY OF ELECTRICITY AND A CHRONOLOGY OF ELECTRICITY AND ELECTROTHERAPEUTICS. By Herman Goodman. New York: Medical Life Press, 1928. 62 pp. Price, \$1.50.

MANUAL OF FOOD LAWS. Compiled by the Staff of Los Angeles County Health Department. Los Angeles: Harold Roe, 1928. 138 pp. Price,

THE INTELLIGENT WOMAN'S GUIDE TO SOCIALISM AND CAPITALISM. By Bernard Shaw. New York: Brentano's, 1928. 495 pp. Price, \$3.00.

THE HEALTH AND HAPPINESS SERIES. By S. Weir Newmayer and Edwin C. Broome. New York: American Book Co., 1928.

THE PLAY ROAD TO HEALTH. 144 pp. Price \$.64

HEALTH HABITS. 207 pp. " .72

THE WAY TO KEEP WELL. 264 pp. " .84

THE HUMAN BODY AND ITS CARE 314 pp. " .96

THE COMMUNITY USE OF SCHOOLS. By Eleanor T. Glueck. Baltimore: Williams & Wilkins, 1927. 222 pp. Price, \$3.00.

WATER PURIFICATION. (2d. ed.) By Joseph W. Ellms. New York: McGraw-Hill, 1928. 594 pp. Price, \$7.00.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Scientific Movies—Pitfalls encountered in the production of surgical movies should be of interest to those who contemplate the making of motion pictures dealing with health.

ALBEE, F. H. Science goes to the Movies. *M. J. & Record*, 128:1 (July 4), 1928.

Gonorrheal Vaginitis—The record of admissions to a child-caring institution shows gonorrheal vaginitis more prevalent in winter and spring than in summer and fall. The preponderance of chronic to acute infections is shown.

BLUM, J. Gonorrheal Vaginitis of Infants as a Seasonal Disease. *Arch. Pediat.*, 45:6 (June), 1928.

Immunity in Scarlet Fever—Three papers dealing with scarlet fever, offering evidence and suggesting explanations for this phenomenon: skin sensitivity is lost much more quickly than antitoxin is produced in the blood following prophylactic treatment or following the appearance of the rash during the disease. The importance of hypersensitiveness as a factor is stressed in propounding the hypothesis that the disease is due perhaps to a protein poison rather than a toxin.

COOKE, J. V. Scarlet Fever. *Am. J. Dis. Child.*, 35:6 (June), 1928.

College Athletics and Longevity—A statistical study of the lives of 5000 college athletes (from 1880 to 1905) which indicates that the group studied presented a favorable mortality picture. It is the author's opinion that athletic activities in the loosely supervised earlier period did some damage.

DUBLIN, L. I. Longevity of College Athletes. *Harpers* July, 1928.

Neurologic Infections—A summary of what is known of the epidemiology

and etiology of epidemic meningitis, poliomyelitis, and epidemic encephalitis. As valuable as the name of its author would promise.

FLEXNER, S. Obvious and Obscure Infections of the Central Nervous System. *J. A. M. A.*, 91:1 (July 7), 1927.

Heart Disease Prevention—Another of the multitude of British papers on heart disease and rheumatism. There is probably nothing very new or startling in this one.

FORDYCE, A. D. The Prevention of Heart Disease. *J. State Med.*, 36:7 (July), 1928.

Oral Typhoid Immunization—A review of the results of about a half million vaccinations *per os* against typhoid fever. The theoretical advantages of Besredka's method are discussed.

GARBAT, A. L. The Oral Method of Prophylactic Typhoid Immunization. *M. J. & Rec.*, 128:2 (July 18), 1928.

Chicago Communicable Disease Survey—A committee report of a survey (with criticisms and suggestions) of Chicago health department practice in regard to the control of communicable disease, school hygiene, sanitation, education, etc.

GERSTLEY, J. R., et al. Survey of the Communicable Disease Situation in Chicago. *Am. J. Dis. Child.*, 35:6 (June), 1928.

A Hundred Years of Epidemiology—This paper is the first dealing with the history of epidemiology in Great Britain containing many useful references and quotations for the writer upon health topics.

HAMER, W. H. History of Epidemiology. *Lancet*, 1:26 (June 30), 1928.

Plural Nature of Vitamin B—Irradiated vitamin B carriers lose their growth-promoting factors but retain

their anti-neuritic properties; autoclaved specimens have the reverse characteristics. Used together, they supplement each other.

HOGAN, A. G. and HUNTER, J. E. The Plural Nature of Vitamin B. *J. Biol. Chem.*, 78:2 (July), 1928.

Mental Hygiene—This rather general outline of the possibilities of mental hygiene as a public health function would make an excellent introduction to a book. It lacks suggestions of method.

HILL, T. W. Mental Hygiene and the Child. *Pub. Health*, 41:10 (July), 1928.

Measles Prophylaxis—Additional evidence is offered that Tuncliffe's anti-measles goat serum will prevent measles if given early and modify the disease if given any time during the incubation period.

HOYNE, A. L. and PEACOCK, S. Prevention and Modification of Measles with Antimeasles Diplococcus Goat Serum. *Am. J. Dis. Child.*, 35:6 (June), 1928.

Ricinoleated Vaccines Again—A very brief and pointed note answering Kozlowski's contention that ricinoleic acid causes abscesses and hence should not be used. The author points out that the material purified with barium, as used by Kozlowski, was discarded several years ago and that the type of material used in ricinoleated vaccines causes no ulcerations.

LARSON, W. P. Ricinoleated Streptococcic Vaccines. *J. Immunol.*, 15:4 (July), 1928.

Rural Medical and Nursing Service—The methods by which medical and nursing services are subsidized in the highlands and islands of Scotland are recounted for the benefit of the frontier nursing service of Kentucky.

MACKENZIE, L. Medical and Nursing Service. *Lancet*, 2:3 (July 21), 1928.

Etiology of Encephalitis—Is epidemic encephalitis caused by toxins from organisms in the respiratory or gastrointestinal tract, a cultivable bacterium,

or a filtrable virus? Although most research points to the latter, the author concludes that the etiology remains unproved.

NEAL, J. B. The Present Status of the Etiology of Epidemic Encephalitis. *J. A. M. A.*, 91:4 (July 28), 1928.

Official and Unofficial Relationships—An interlocking directorate by which tuberculosis associations may be made to work harmoniously with the health department and the medical society is proposed. A very worth-while suggestion.

NELBACH, G. J. Fundamentals in Tuberculosis Work with Respect to Voluntary Unofficial Associations. *New England J. Med.*, 198:18 (June 21), 1928.

Liquid Petrolatum and Digestion—Studies of fecal elimination by dogs and human subjects indicating that liquid petrolatum does not interfere with the digestion and absorption of food.

OLSEN, A. B. Effect of Liquid Petrolatum Given by Mouth on Digestion and Absorption of Food. *J. A. M. A.*, 91:3 (July 21), 1928.

Grains and Vegetables in Diet—Experiments are reported indicating the advantage of using whole grains without increasing costs of diet. A freer use of vegetables raises amounts of vitamins, increases laxative properties, and promotes assimilation of iron. Further experiments are recorded indicating the value of eggs when added to otherwise balanced diets.

ROSE, M. S., and MCCOLLUM, E. L. Studies in Nutrition. *J. Biol. Chem.*, 78:2 (July), 1928.

The British Milk Supply—An interesting round-table discussion of milk supply supervision in Great Britain. The introducer discusses "milk as a food and milk as a poison," and quotes someone as saying he'd as soon see graded water as graded milk.

WYNNE, F. E. Present Position of the Milk Supply. *J. Roy. San. Inst.*, 48:1 (July), 1928.

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Bellevue-Yorkville Health Demonstration—The annual report for 1927 consists of four parts, an historical summary, an account of the year's activities, a statistical report of volume of work, and a financial statement. A study of school medical inspection in the 24 schools of the district, a study of stillbirths, and a study of street accidents have contributed basic information of considerable interest. Accidents of all types in the district are responsible for more than 10 per cent of the general mortality. Campaigns for the prevention of colds (32,000 pieces of literature distributed), and of diphtheria (3 months' intensive drive for immunization, 31,000 pieces of literature and 2,300 posters distributed, among other activities), and many other health education measures are described. Several important clinics have been opened.

During the year, there was a total attendance at the various clinics and services of 32,488, of which 12,921 visits were to the baby health station, located within demonstration headquarters. There was also an attendance of 18,559 at the 646 meetings held at headquarters for educational purposes. Of the 46,756 home care visits made in the district by the agencies located in headquarters, 21,330 were directly for bedside care and generalized nursing service by the Henry Street Settlement, 12,593 home care visits by the Department of Health nurses, for infant welfare (4,885), control of contagion (3,835), and tuberculosis supervision (3,875). Detailed statistical tables conclude the report.

San Diego, Calif.—In 1927, a population of 114,900, a birth rate of 23.7, and a resident death rate of 13.9 (not

corrected 18.2), are recorded for this city. An infant mortality rate of 60.6 is compared with a rate of 46 for the previous year, 99 of the 165 infant deaths occurring in the first month of life.

During 1927, there were reported 977 personal injuries resulting from motor vehicle accidents occurring in the city, as compared with 1,039 the previous year. Of this number, 282 were pedestrians. A total of 35 persons were injured in automobile and street car accidents as against 54 in 1926. There were 37 deaths from this cause as compared with 46 the previous year. The noted improvement is encouraging in view of the efforts made during 1927 to reduce the number of automobile accidents, by the traffic commission, the police department, the courts, the public safety committee, the local press and others.

The child hygiene division report includes 55 prenatal clinics with 279 attending, 93 well baby conferences with 2,538 attending, 696 prenatal nursing visits, 363 maternity visits, 878 visits to sick babies, 320 instruction visits, 465 emergency visits and 44 Little Mothers' classes.

Rockefeller Foundation—The president's review for 1927 contains a stimulating account of health activities in many lands. A list of 20 of these activities indicates the broad scope of the Foundation's interest: aided in local health organization in 85 counties of 6 states in the Mississippi flood area; operated an emergency field training station for health workers in this region besides contributing toward the support of 9 other training centers elsewhere; assisted 9 schools or institutes of public health and 3 departments of hygiene in university medical schools; gave aid to 17

nurse training schools in 14 countries; supported the Peking Union Medical College; paid 2 million dollars toward a new site for the University of London; helped Brazil to maintain precautionary measures against yellow fever; continued studies of that disease in West Africa on the Gold Coast and in Nigeria; had a part in malaria control demonstrations or surveys in 8 states and 11 foreign countries; aided 19 governments to bring hookworm disease under control; contributed to health budgets of 268 counties in 23 states of the American Commonwealth and of 31 similar governmental divisions in 14 foreign countries; helped to set up or maintain public health laboratory services or divisions of vital statistics, sanitary engineering, or epidemiology in the national health services of 19 countries abroad and in the state health departments of 16 American states; made grants for mental hygiene work in the United States and Canada; provided funds for biological research in universities; helped the League of Nations to conduct study tours or interchanges for 125 health officers from 44 countries, to supply world-wide information about communicable diseases, to train government officials in vital statistics, and to establish a library of health documents; provided fellowships for 864 men and women; made appropriations for improving the teaching of premedical sciences, and for expenses of hospitals in China, and for equipment and literature for medical centers; lent staff members as consultants and made surveys of health conditions and of medical and nursing education in 14 countries.

In discussing the relation of private agencies and public authorities, this significant statement is made:

Under anything like normal conditions the voluntary health association does its best work when it keeps always in mind the aim of strengthening the official organization of the community. Every private agency should be only too glad to turn over to an efficient health

department a service or activity which has been built up by voluntary effort. To be sure, it may be at times the duty of a private association to attack openly an incompetent or politically corrupt health administration, but ordinarily friendly support of even a weak official will prove a sound policy. To express confidence that he is going to do the right things will help him to meet expectations.

It is interesting to learn that Yugoslavia requires of every medical student 6 months' service with a department of health. In considering the training of doctors for a new era, it is emphasized that the idea of preventive medicine will never fully prevail until more doctors enter the field as leaders, until physicians in general understand and actively support public health activities and until they themselves seek to keep people well through periodic examinations and by advice about personal hygiene. "If this is ever to happen, medical schools will have to change their courses and their attitude."

Association of Tuberculosis Clinics, New York, N. Y.—The 1927 report shows on the inside cover the location of the 15 clinics in the various districts of Manhattan. The membership of this voluntary organization includes 29 tuberculosis clinics which function either under municipal or private organizations. In general, the activities are confined to clinic and home work among the tuberculous and the exposed families of these patients. The objects include the promotion of clinic control of tuberculosis in the city, the development of uniform methods of operation and the provision of equally efficient care throughout the city, the elimination of duplication, the keeping of patients under observation until satisfactorily cared for either in a sanatorium or hospital, the gathering of uniform statistics, the coordination of activities, and the assistance of the department of health in its control of tuberculosis.

Important studies were carried on during the year. More than 16,000 children were treated in these clinics in which more than 37,000 persons were examined, among whom were 9,362 cases of tuberculosis. The clinic attendance was 93,356, of which number 36,891, or 1 out of every 3, were visits by children. In addition, more than 46,000 home visits were made by the clinic nurses to tuberculosis cases or their families, and 9,608 more to social or medical agencies on behalf of clinic patients. The data for these clinic patients and services are analyzed in detail and valuable statistical tables are included.

Miami County, O.—The population of this county health district in 1927 was estimated as 26,502, with only 0.4 per cent colored and 0.4 per cent foreign born. A birth rate of 15.5, a crude death rate of 11.2, a tuberculosis death rate of 3.4 (per 100,000) and an infant mortality rate of 46.1 were recorded. Of 19 infant deaths, 14 occurred during the first month. One nurse is employed by the Board of Health, and one by the state and federal government, but their work is arranged on a generalized basis, with a nurse employed jointly by one of the local boards of education and boards of health acting as supervisor. The health officer is secretary-treasurer of the county public health league, and also of the county medical society, and is medical director of school work in Troy. There are other indications in the report of interesting coöperative enterprises. Forty-nine per cent of the school children are protected from diphtheria. A gross per capita expenditure of 39 cents for the year is reported by the department.

Victoria, Australia—A new code of duties of medical officers of health has been issued by the Commission on Public Health. Furthermore, the Health Act

1919, requires the appointment of qualified inspectors by councils, but allows the retention of long-service inspectors. At present, the 1927 report states, 81 councils employ inspectors qualified by examination, and 82 employ inspectors qualified by 5 years' service before the passing of the Act, while 31 were granted exemption. The combination of neighboring municipalities in making joint appointments of full-time inspectors is encouraged. It is also interesting to observe from this report that diphtheria immunization, particularly of school children, is gradually being undertaken in different districts.

Manchester, N. H.—The Health Officer of Manchester is also superintendent of the isolation hospital. The city of 82,500 population in 1927 expended 96 cents per capita, including 33 cents per capita for the hospital. The staff organization is shown in the first 2 pages of the report, and this is followed by a 1-page statistical summary for the last 2 years. The lowest general death rate ever recorded for the city is that of 1927—10.55. A birth rate of 20, an infant mortality rate of 71, a tuberculosis death rate of 56 (per 100,000), and a diphtheria death rate of 2.4 are noteworthy.

Diphtheria prevention work started in November, 1921. During that year, 469 cases and 31 deaths were recorded, as compared with 9 cases and 2 deaths in 1927. A prenatal and preschool child service is being developed by the district nursing association in coöperation with the local medical association and the health department. Births are analyzed in the report by months, wards, nativity, and infant deaths are classified by ages, months, and cause. Of 108 infant deaths during the year, 76 occurred in the first month of life, 72 being classed as due to congenital or early infancy causes. By legislative enactment, on and

after June 1, 1928, all milk sold in restaurants, lunch rooms, or on stands must be dispensed in the original package. The report contains several interesting statistical tables with descriptive text.

Cincinnati Dental Survey—As a result of the formation in 1922 of the Mouth Hygiene Council of the Cincinnati Public Health Federation, there has recently been completed and published a survey report of community dental facilities. The purpose of the council is stated to be to coordinate the work of the organizations in the city, which are doing any phase of mouth hygiene work; to eliminate any duplication that may exist, and to formulate plans for meeting needs which now exist or which may arise and which are not adequately met.

In Cincinnati in 1925, with a population of 408,559, there were 396 dentists (1 to 1,107 persons) and 901 physicians (1 to 453 persons). The ratio of dentists to population in the United States is 1 to every 1,882 persons. All general hospitals in the city render service in oral surgery and extraction. Prophylaxis, treatment, X-ray, laboratory, referred cases and observation seem to be services common to most of them. All children entering Children's Hospital on general service and all clinic patients including 2 years of age, are given routine dental examinations. The dental department is combined with the surgical, so that extraction and surgical procedures may be carried out in one of the operating rooms. Interesting data are submitted for both general and special institutions.

The Public Dental Service Society, in cooperation with the Board of Education, serves pupils in public schools. Certain health centers and dispensaries maintain completed services, while the dental clinic of the Babies' Milk Fund Association, for example, is limited to the care of expectant mothers and children of preschool age. As in many other cities, the facilities for adults are limited, although a few organizations and health centers are attempting to meet this situation. The scope of these activities and the organization of services are detailed in this interesting report of 52 pages.

Among the suggestions for a community dental program, it is recommended that the excellent opportunity for educational and dental inspection work in connection with the summer round-up of preschool children, be utilized. It is further stated that the entire service of dental examinations, dental prophylaxis and curative work for school children who cannot afford to pay, should ultimately be conducted by the Board of Health entirely at public expense, and that this should include adequate supervision. It is felt that education in dental hygiene among school children will be most effective if incorporated in a general scheme of health education and training in health habits. The Board of Health has established in its health center a chair for corrective dental work for adults—at present limited to patients registered in the tuberculosis and venereal disease clinics. It is recommended that this service shall be made available for other patients. "Further provision for adult dental service should be provided by the outpatient department, especially to provide for indigent cases referred by family service agents."

NEWS FROM THE FIELD

DR. FRANCIS HONORED

EDWARD Francis, M.D., of the U. S. Public Health Service, was presented with a gold medal by the American Medical Association at its annual meeting held in Minneapolis, Minn., in June, for his research work on tularemia. The committee on awards in making the presentation considered the results obtained by Dr. Francis the most important medical work of the year. Dr. Francis is recognized as the outstanding authority on this disease in the United States. While studying his first case of the disease in Utah, Dr. Francis fell a victim to tularemia and has since devoted his time to the prevention and cure of the disease.

Tularemia was discovered in a ground squirrel in Tulare County, Calif., in 1910 by Dr. G. W. McCoy of the U. S. Public Health Service.

MICHIGAN PUBLIC HEALTH ASSOCIATION

THE Michigan Public Health Association held its midsummer meeting July 14 at the University of Michigan, Ann Arbor, Mich. Members attended the Public Health Institute which was in session that day. County and district health units were the principal subjects discussed under the leadership of Senior Surgeon L. L. Lumsden of the U. S. Public Health Service, and Guy L. Kiefer, M.D., Commissioner of Health, State of Michigan. Other sessions were devoted to "Our Present Knowledge of Cancer," by A. S. Warthen, M.D.; "Tularemia," Walter M. Simpson, M.D.; "Typhoid Fever," L. L. Lumsden, M.D.; "Rabies," Haven Emerson, M.D.; and "Health Economics," Nathan Sinai, M.D. Assistant director of the National Committee on the Cost of Medical Care. John Sundwall, M.D., president of

Michigan Public Health Association chose as the subject of his presidential address, "The Physician and the Layman in Public Health Work."

CANADIAN FARMERS' HEALTH PROTECTED

DOCTORS and hospital facilities are brought to the door of the Canadian farmer living in the western prairie provinces, by the traveling clinics that have been instituted to serve the isolated rural districts. Each clinic in this rural medical service includes 3 nurses, 2 doctors and a dentist. In the case of a tonsillectomy and the removal of adenoids, one doctor performs the operation while the other doctor remains behind for 24 hours after the clinic has moved on to supervise the convalescence of the patients.

During 1927 the provinces reported the following births per 1,000 population: Manitoba, 22.9; Saskatchewan, 25.0; Alberta, 23.8; British Columbia, 17.4. The corresponding deaths for these provinces respectively were: 8.3; 7.4; 8.5, and 9.6. This report was made by the Department of Colonization and Development of the Canadian Pacific Railway.

INCREASE OF CANADIAN FULL-TIME HEALTH UNITS

FULL-TIME health units established in the provinces of Canada are rapidly increasing. The greatest development of this medical service has been in the Province of Quebec, and before the year closes it is contemplated that at least 20 more units will be established. British Columbia and Saskatchewan also have several full-time health units.

A unit consists of a full-time health officer who has had training in public health administration; one or more public health nurses; a sanitary inspector

and a clerk. Such a staff cares for the health of a county of about 40,000 population. The total cost of operating a unit, including traveling expenses is from \$10,000 to \$12,000 a year.

The Pictou County Medical Society, Nova Scotia, recently appointed a committee to investigate the establishment of a full-time health unit in Pictou County.

INDUSTRIAL SANITATION AT HARVARD

A NEW course of study in the Harvard Engineering School in coöperation with the Harvard School of Public Health will be inaugurated at the opening of the college year. Directors of these schools have become convinced that there is a need for engineers whose special studies have prepared them to cooperate with the industrial physician in problems of plant sanitation and hygiene. This course to be known as "Industrial Sanitation," will lead to the degree of Master of Science in Engineering.

HEALTH—SUBJECT AT CALIFORNIA MUNICIPAL INSTITUTE

PUBLIC health was one of the subjects discussed at the Institute of Municipal Administration at the University of Southern California, Los Angeles, Calif., August 13-18. This was the first educational project of its kind for municipal directors. The institute brought together mayors, city managers and commissioners, city and county officials and citizens actively interested in public affairs. The 6-day program covered a scientific and practical study of modern municipal administration.

Abel Wolman, chief engineer of the State Department of Health, Baltimore, Md., a member of the Engineering Section of the American Public Health Association, headed the section on sanitary engineering. Professor Ira V. Hiscock of the School of Public Health, College of Medicine, Yale University, also a

member of the American Public Health Association, and who was in Los Angeles County making an appraisal of health activities of the county, under direction of the Committee on Administrative Practice, American Public Health Association, was a special lecturer on public health at the Institute.

SEDGWICK MEMORIAL LECTURE AT WOODS HOLE

THE seventh William Thompson Sedgwick Memorial lecture was given by Edwin Grant Conklin, Ph.D., Sc.D., LL.D., at the Marine Biological Laboratory, Woods Hole, Mass., July 27. Dr. Conklin's subject was "Problems of Development." He is a member of the National Academy of Sciences and Professor of Biology, Princeton University.

This lectureship was established in 1922. The lectures are under the auspices of the Department of Biology, Massachusetts Institute of Technology, which was created by Professor Sedgwick. The previous lecturers have been, Edmund Beecher Wilson, Ph.D., M.D., William Henry Welch, M.D., Winthrop John Vanleuven Osterhout, Ph.D., Sc.D., Charles Value Chapin, M.D., Sc.D., Thomas Hunt Morgan, Ph.D., S.C., and Haven Emerson, M.D.

HEALTH TO BE TAUGHT BY MOTION PICTURES

A series of health education films for use in classrooms of public schools will be worked out by the Department of Biology and Public Health, Massachusetts Institute of Technology, and the Eastman Teaching Films, Inc. Professor C. E. Turner of M. I. T. will direct the preparation of the subject matter to be filmed, and he will be assisted by Georgie B. Collins, who has resigned as director of health education in the public schools of Malden, Mass., to begin work on the films.

BETTER HEALTH IN MISSISSIPPI FLOOD AREA

DEVELOPMENT of sanitation following the Mississippi Valley flood has steadily extended throughout the flood area until 78 counties are listed as receiving adequate public health protection from a staff of more than 300 full-time health workers. The U. S. Public Health Service reports that better communities are being built on the ruins of those destroyed by the flood, and that a modern and more extensive health program has been inaugurated.

RADIUM-MESOTHORIUM DANGEROUS

THE Committee on Public Health Relations of the New York Academy of Medicine is protesting the extent of the use of radium-mesothorium in industry because of its danger to workers. The committee has sent a protest to Surgeon General Hugh S. Cumming of the U. S. Public Health Service in the hope that he will investigate conditions.

MANY CALIFORNIA WATER SUPPLIES ARE NOW CHLORINATED

A recent survey of public water supplies in California reveals the fact that the water from 68 such supplies is

chlorinated, thereby insuring the safety of the drinking water used by 3,185,000 regular consumers. The total amount of water so treated is one-half billion gallons daily. This constitutes an outstanding achievement and is largely responsible for the great reduction in water-borne typhoid in California. The development of this procedure has been comparatively rapid, since chlorination was started in California only 13 years ago.

ENGINEERS GO TO JAPAN

THE first World Engineering Congress will be held in Tokio, Japan, October, 1929, under the auspices of the Kogak-kai, the Engineering Society of Japan. The purpose of the congress, first proposed by the Kogakkai, which is making elaborate preparations for the international meeting of engineering societies, is to promote international coöperation in the study and application of engineering science and permit the exchange of professional ideas.

The American committee with headquarters at the Engineering Societies Building, New York, N. Y., is planning the program to be contributed by American delegates from national engineering societies.

PERSONALS

DR. J. L. PARKER has been appointed City Health Officer of Brawley, Calif., to succeed Dr. Eugene Le Baron, who has served that city for many years.

DR. CLARA M. RINEHART has been appointed City Health Officer of Tehachapi, Calif., to succeed Dr. Rupert G. Doupe.

CLARENCE R. WALTER has succeeded Dr. M. E. Westphal as City Health Officer of Atherton in San Mateo County, Calif.

DR. JOHN W. COX of Alexandria, Va., has been appointed a field representa-

tive of the American Society for the Control of Cancer, New York, N. Y.

DR. GEORGE H. PRESTON, Baltimore, Md., has been appointed Commissioner of Mental Hygiene by Governor Ritchie to succeed the late Dr. Arthur P. Herring.

DR. PHILETUS A. HAYES, for more than 32 years Health Officer of Afton, Chenango County, N. Y., resigned on July 1.

DR. FRED J. WAMPLER has been appointed Professor of Preventive Medicine in the Medical College, University of

Virginia, and Medical Director of the out-patient department. He will also have charge of the laboratory of clinical pathology. Dr. Wampler was formerly field associate director for Shansi Province, China, for the Council on Health Education. At one time he served as acting director of the council.

DR. JOHN A. GARDNER has resigned after many years' service as Health Officer of La Grange Park, Ill.

SURGEON GENERAL HUGH S. CUMMING has been elected a corresponding member of the Royal Society of Medicine of Great Britain.

EDNA L. FOLEY, Superintendent, Visiting Nurse Association of Chicago, has been awarded the honorary degree of Doctor of Science by Smith College, in recognition of her work in the field of public nursing. Smith College has awarded this degree to only a few others, among whom are Madam Curie and Dr. Alice Hamilton.

DR. SAIR C. MOORE has been appointed Health Officer of Cadillac, Mich.

DR. PAUL D. MOSSMAN, trachoma specialist of the U. S. Public Health Service, recently made a tour at the request of the Montana State Board of Health to ascertain in which sections of the state trachoma exists. The schools of Wolf Point and Cut Bank, Mont. were particularly examined, as there seemed to be a confusion of opinion in the diagnosis of cases in these schools.

DR. EDWARD P. WHITE, Columbia, S. C., has been appointed Director of the Cherokee County Health Department, succeeding Dr. Patrick H. Smith of Gaffney, S. C.

DR. WALTER G. DARLING has been appointed Health Officer of Shorewood, Wis., to succeed Dr. H. H. Becker.

DR. ROLAND E. SCHOEN has been appointed Health Officer of Beaver Dam, Wis.

DR. JAMES D. LEWIS has resigned as Director of Public Health of Scranton, Pa.

DR. WILLIAM L. HELMS has been appointed Health Officer of Taylor, Tex.

DR. MARY BERKES WETMORE, the first woman graduate from the School of Medicine, University of Buffalo, died June 18 in Buffalo. She was the widow of Dr. Samuel W. Wetmore a physician of Buffalo a member of the faculty of the Buffalo University School of Medicine.

DR. J. F. HAZZLEWOOD, director of the Toronto Public Health Laboratory, Toronto, Can., has resigned to fill the vacancy of the Medical Staff of the Ontario Workmen's Compensation Board caused by the death of Dr. W. E. Struthers.

DR. S. B. RICHARDS has been appointed health officer of San Bernardino County, Calif., to succeed Dr. Emil W. Meyer.

DR. JOHN B. CRAIG has been appointed Health Officer of the City of Upland, Calif.

DR. SIDNEY A. GOYETTE, Yuba City, Calif., has succeeded Dr. Trusten P. Peery as Health Officer of Sutter County.

DR. ARNOLD S. ANDERSON, who was formerly with the sanatorium is now in charge of the tuberculosis division of the Minnesota Public Health Association, St. Paul, Minn.

DR. JAMES S. FITZHUGH, Island, Ky., has resigned as Health Officer of McLean County.

DR. HARRIS W. TERRELL has been appointed full-time Health Officer of Ohio County, Ky.

DR. ALEXANDER A. WEECH, Baltimore, Md., is to spend a year in Peking Union Medical College, Peking, China, as associate professor of pediatrics.

DR. CLARENCE W. BUCKMASTER has been reappointed health officer of Yonkers, N. Y.

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American Journal of Public Health

and THE NATION'S HEALTH

Vol. X No. 10

Volume XVIII

October, 1928

Number 10

Malden Studies on Health Education and Growth

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Technology, Cambridge, Mass.*

IN 1925, the writer made a preliminary report upon a series of health education studies which were undertaken in the city of Malden, Mass., in the fall of 1921 to answer the following questions:

Is health education practicable?

Can the child's habits be changed through health education in school?

What are the best methods in health education?

Does health education have a measurable effect upon growth?

The preliminary report¹ gave clear-cut evidence of the practicability of health training in schools, and presented specific data showing improvement in several health practices. The results of the study looking toward the development of ideal methods are to be found in the books of the Malden Health Series.² Brief reports upon special phases of the studies have been made in the *Journal of the National Education Association*.³ The present report deals only with the last of the four questions.

SELECTION OF GROUPS AND THE COLLECTION OF DATA

The preliminary report describes the procedures used in placing one group of children under an organized health education program and in collecting health and growth data from this group and a similar control group of children. The present paper reports upon the significance of growth data. The sanitarian, educator, or statistician will ask two questions at the outset:

Were the experimental and control groups of children fair and comparable samples of the school population?

Were the records collected with accuracy and uniformity?

As shown in the earlier report, the children selected for the study

CHART I

DISTRIBUTION OF WEIGHT BY FIVE POUND CLASSES, OCT. 1921

DISTRIBUTION OF WEIGHT BY FIVE POUND INTERVALS

WEIGHT GROUP	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	POUNDS			
1		5	7	8	5	5	2		1																	No = 132 EXPL. GROUP BOYS MEAN WT. = 73.5 LB.		
2	1		8	11	19	7	9	5	4	1		2															No = 141 EXPL. GROUP GIRLS MEAN WT. = 73.8 LB.	
3				3	4	8	4	1	4	2		1	1															No = 107 CON'L. GROUP BOYS MEAN WT. = 74.0 LB.
4									1	1	1					1												No = 95 CON'L. GROUP GIRLS MEAN WT. = 76.3 LB.
5	2	8	9	6	4	5	4	2	4																			
6		3	8	10	12	8	7	3	2	4	1																	
7			2	6	3	7	4	4	3	2	2																	
8									1	1			2	1	1													
1	2	3	6	4	5	4	1																					
2	2		8	11	11	7	8	4	2	1					1	1												
3				5	3	5	4	2				1		1	1													
4											1				1				1	1								
5		2	9	2	8	1	3	1																				
6		4	4	10	6	3	9	2	5	2		1																
7		1		2	2	2	2	2	2	1					1													
8						1					1	2					2		1					1				

For purposes of this study the children were separated into groups on the basis of their relationship to normal weight. Groups 1 and 5 include children more than 10 per cent underweight; groups 2 and 6 include children from 90 per cent to 100 per cent of average weight; groups 3 and 7 include children from 100 per cent to 120 per cent of average weight; and groups 4 and 8 include children more than 120 per cent of average weight.

included all children in the 4th, 5th, and 6th grades in the Faulkner and West Schools. The children in the control group consisted of all of the pupils in the same grades at 3 other selected schools. The two groups of children represented the same racial types of similar economic status. The conditions of living of the two groups were not changed except for the health education program given to the children in the experimental group.

Perhaps the best comparative biological data for the two groups will be found from a study of their growth status at the beginning of the experiment (see Table I). Data for boys and for girls are given separately because of their different growth rates. It will be seen that the average age, height, weight, and relationship to normal indicate that the two groups of boys were almost exactly comparable. A similar indication will be seen from a study of Chart I. A similar study for the two groups of girls will show that the girls in the control group were biologically superior to those in the experimental group since, although they were younger, they were taller, heavier, and there were fewer underweight.

These figures show that up to the time the experiment began the growth of the two groups of boys had been practically the same and

TABLE I

ORIGINAL MEASUREMENTS AND GROWTH SUMMARIZING DATA
FOR EXPERIMENTAL AND CONTROL GROUPS

M. I. T.—MALDEN STUDIES IN HEALTH EDUCATION

	Boys		Girls	
	Experimental	Control	Experimental	Control
Number of children	132	107	141	95
		Characteristics October, 1921		
Average age	11.1 yrs.	10.8 yrs.	11.0 yrs.	10.8 yrs.
Average height	55.2 in.	55.3 in.	55.2 in.	55.8 in.
Below average weight *	76%	76%	72%	75%
10% below average weight *	25%	23%	31%	27%
Average relation to Wood weight normal	95.8%	96.0%	96.6%	97.1%
Average weight in pounds	73.5 (± 0.7)	74.0 (± 1.1)	73.8 (± 0.8)	76.3 (± 1.3)
Growth Data				
Expected average gain for 20 months on basis of age alone †	12.7 lbs.	12.4 lbs.	16.3 lbs.	16.1 lbs.
Actual average gain for 20 months	13.52 lbs. (± 0.40)	11.13 lbs. (± 0.46)	15.31 lbs.	15.10 lbs.
Actual average gain for 20 months in terms of original weight	18.4%	15.1%	20.7%	19.8%
Average gain in height, October, 1921, to June, 1922	1.25 in.	1.00 in.	1.50 in.	1.14 in.
Underweight Children Only				
Number of children	100	81	102	72
Average weight, October, 1921	70.8 lbs.	70.5 lbs.	70.4 lbs.	71.0 lbs.
Expected gain for 20 months on basis of age alone †	12.9 lbs.	12.3 lbs.	16.6 lbs.	16.0 lbs.
Actual gain for 20 months	13.22 lbs.	11.06 lbs.	14.87 lbs.	14.25 lbs.
Actual gain in terms of original weight	18.6%	15.7%	21.2%	20.1%

* Based upon Wood Tables.

† Based upon Baldwin Averages.

that any superiority in growth which did exist was in favor of those in the control group. They show that the girls in the experimental group had grown distinctly less rapidly than the girls in the control group up to that time. These figures give us further assurance concerning the comparability of the two groups, supplementing as they do our care in selecting them.

The children were weighed at the same time each day and with the lightest indoor clothing.* Such individual variations as would naturally exist in the weight of clothing or ingested food would balance in group averages. Periodically the scales were tested for accuracy. Weights were taken to the nearest quarter pound. The children in

* Georgie B. Collins collected all of the data from the experimental group, and trained the nurse who assisted in the collection of data from children in the control group.

the experimental group were weighed monthly, and those in the control group three times a year.

Height was taken for both groups three times each year. Both height and weight were taken with shoes on. Because of the unpopularity of the removal of shoes, the children were permitted to keep them on, as individual variations were counterbalanced in averages.

In addition to collecting height and weight data, computations were made to show the relationship of each child to average or normal weight. No attempt was made to determine the relative importance of the various habits in which improvement was demonstrated. We were seeking to determine whether the combined effects of health training through the classroom were sufficient to produce differences in the growth rate which were significant and which could not possibly be due to *accidental* variations in the rate of growth of individuals in the two groups studied.

INCREASE IN WEIGHT

The boys with the health education program showed an average gain for the 20 months of the experiment amounting to 13.52 pounds while the boys in the group which did not have the health education had a gain for the corresponding period of 11.13 pounds. The former group gained 18.4 per cent of its original weight, the latter 15.1 per cent of its original weight. The gain in weight of the boys having the health education program exceeded the gain of the boys without health training by 21 per cent.

Table I shows that such slight differences as existed in height, weight, and the percentage of the group seriously underweight, were in favor of the boys in the control group. One notices, however, that the average age of the boys in the experimental group was 0.3 year greater than that for the control group. The expected gain at different ages varies, and one naturally asks whether this difference in the rate of gain may not have been due to an accidental age distribution because of which there were more boys in the experimental group at ages of maximum gain.

In order to determine whether the greater gain in weight may have been due to the age distribution of the group we determined the expected gain on the basis of age alone. Studies of the gains of many thousands of children at different ages have made it possible to prepare tables showing the average or expected gain for boys and for girls at each age level. Such data are given by Baldwin¹ in terms of expected or average gain in ounces per month. By determining the number of boys at each age level for each of the two years of the

study; multiplying the number of boys at each age by the expected gain for that age and adding the product; we get the total expected gain on the basis of age alone for each group. From this we find the expected gain for boys in the experimental group to be 12.7 pounds (on the basis of age alone) and for the boys in the control group 12.4 pounds. Clearly the difference in rate of gain was not due to age distribution. This is further emphasized by the fact that up to the time the study began the boys in the control group had been growing slightly faster than the boys in the health education group.

There remains to be considered the statistical analysis of the data with a consideration of the limits of error. Such a study will tell us whether these differences in average growth are *accidental* differences, due to a statistical population of scattered variants which are overlapping, or whether the differences are so great as to make it certain that they are *real*.

Chart II shows the distribution of gains in weight by classes for the 20-month period in question. This distribution, like the one shown above, keeps the division of children according to the four weight groups into which they fall. Let us compare the two populations, applying the following commonly used formulae.

$$\sigma = \sqrt{\frac{\sum D^2 f}{n}}$$

$$\text{P. E. Av.} = \pm 0.6745 \frac{\sigma}{\sqrt{n}}$$

$$\text{P. E. diff.} = \sqrt{(\text{P. E. Av.}_1)^2 + (\text{P. E. Av.}_2)^2}$$

Completing these computations, we find group 1 (Health Education) to have a mean of 13.58, with a probable error of ± 0.40 . Group 2 (Control) has an average of 11.08, with a probable error of ± 0.463 . The probable error of the difference $\sqrt{0.40^2 + 0.463^2}$ is ± 0.612 .

$$\frac{\text{Diff.}}{\text{P. E. diff.}} = 4.09.$$

We see that the actual difference between these averages is more than four times the probable error of the difference. We have then a measure of the reliability of this difference. If the difference divided by the probable error of the difference were zero, there would be an even chance or fifty chances in one hundred that the true difference was greater than zero. Under such a condition it would be expected that in a long series of trials half of the experiments would show a superior growth in one group and half in the other. Similarly we find that when the difference is four times the probable error of the difference the "chances in one hundred" are 99.7 that the true difference under the contrasted conditions is greater than zero. In other words,

CHART II

DISTRIBUTION OF GAINS IN WEIGHT BY 3.25 LB. CLASSES—OCT. 1921—JUNE 1923

	2.50	5.75	9.00	12.25	15.50	18.75	22.00	25.25	28.50	31.75	35.00	38.25
GROUP 1		5	14	5	3	3	1	1		1		
EXPERIMENTAL BOYS GROUP 2		4	28	13	5	5	4	1	7			
NO 132 GROUP 3		6	6	6	4	1	3	1	1	1		
GROUP 4		1			1	1						1
GROUP 5	1	4	10	10	10	8	1					
EXPERIMENTAL GIRLS GROUP 6	1	2	10	8	11	12	6	5	3			
NO 141 GROUP 7	1	2	7	4	4	7	4	3	1			
GROUP 8				2	1	1			1			1

	24.25	175	5.00	8.25	11.50	14.75	18.00	21.25	24.50	27.75	31.00	34.25	37.50	39.25
GROUP 1	1		7	10	3	2	3		1					
CONTROL BOYS GROUP 2			13	17	15	4	3	1	1	1	1			
NO 107 GROUP 3				8	8	2		1			1		1	
GROUP 4	1					1			2				1	
GROUP 5			3	1	7	6	6	3						
CONTROL GIRLS GROUP 6		4	2	6	10	10	5	4	1	2	1			1
NO 95 GROUP 7		1	1	3	2	1	2		1	3				1
GROUP 8			1	1		2	1		1		1			1

in this case the actual difference is enough greater than the probable error to indicate complete reliability.

It may be noted that one boy in the control group actually lost weight instead of gaining over the period of this experiment. This was not because of illness. Because the case was unusual, however, it was desired to see whether it would affect the general results. Consequently that case was dropped from the list, and complete computations were made once more for the 106 boys remaining in the control group. These computations showed an actual difference of 3.8 times the probable error of the difference, or 99.5 chances in one hundred that a real difference exists.

Comparison of the figures in Table I will show that the data for the *underweight* boys considered separately are essentially similar to the data for the group as a whole.

The comparison between the weight increases of the two groups of girls is no less significant but very different in nature. The two groups of boys were alike, but the boys with health education made an appreciably better gain. In the case of the girls those having health education, although smaller and biologically inferior, gained slightly more in weight than did the larger and superior girls in the control group.

The girls in the control group were slightly nearer to normal weight than the girls in the experimental group. They averaged 0.6 inch taller, and 2½ pounds heavier. Thus, although they were a trifle younger and would have been expected to be slightly smaller, they

were in reality appreciably taller and heavier and slightly nearer to normal weight. Their growth rate in both height and weight had, therefore, been more rapid than that of the girls in the experimental group up to the time this experiment began.

The average gain in weight for girls in the experimental group was 15.31 pounds for the 20-month period; and for the girls in the control group the average gain was 15.10 pounds. The difference between these gains is not appreciable. The significant fact is that the smaller girls in the health education group gained as much as the larger girls in the control group.

The computation of expected gain on the basis of age alone (experimental 16.29 pounds; control 16.10 pounds) shows a similar expected gain for the two groups on the basis of age distribution. We find that the girls in the health education group gained 20.7 per cent of their original weight and the girls in the control group gained 19.8 per cent of their original weight.

As will be seen by reference to Table I, the comparative results from the underweight girls *only* are similar to those from the group as a whole.

GROWTH IN HEIGHT

Because of an unfortunate error which was not noted until *too late*, data for height failed to be taken for one section of the control group during the second school year of the study. We are able, however, (1) to compare the growth in height for the two groups during the *first* year, and (2) to compare the growth in height for the health education children for the 20-month period with the expected standards.

Comparing the growth of both boys and girls in the experimental and control groups for the period October, 1921, to June, 1922, we find that the children in the health education group gained 1.375 inches and the children in the control group 1.062 inches. Computing the expected gain on the basis of age, according to the plan outlined above we find that the expected gain for the children in the experimental group was 1.37 inches and for the children in the control group 1.39 inches. Actually the children having health education gained in height 28 per cent more than the children who did not have health education. Statistical computations for the two groups, like those indicated in the above section on weight, show that the actual difference in average gain between the two groups was 8.8 times the probable error of the difference

$$\frac{\text{Diff.}}{\text{P. E. Diff.}} = 8.8.$$

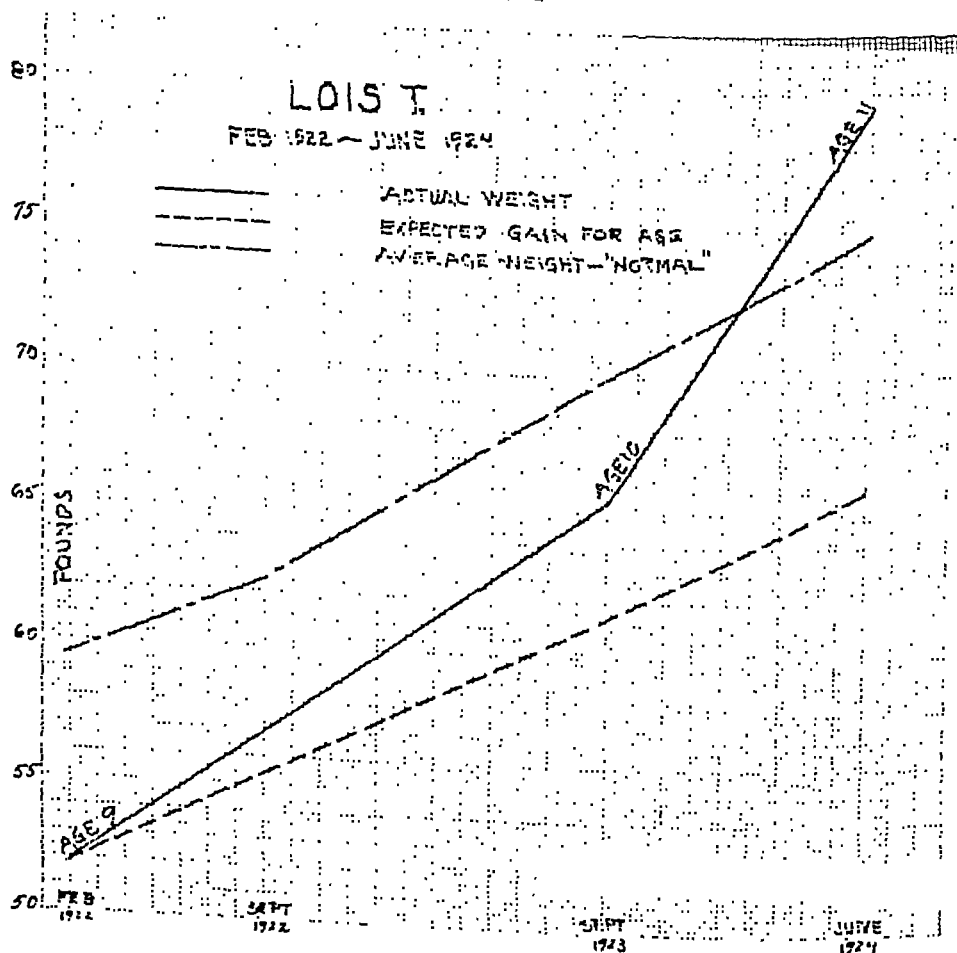
Comparing the growth in height for the children in the health education group over the 20-month period with the expected gain on the basis of age, we find that the actual gain was 2.25 inches and the expected gain was 2.05 inches. The actual gain was, therefore, 9 per cent greater than the expected gain.

The comparable increase in growth rate in both height and weight shown by the health education group is further borne out by the following data on the relationship of these two groups to normal weight.

RELATION TO "NORMAL" OR AVERAGE WEIGHT

We have heard much about underweight among school children, and many public school systems have come to use extensively the figure of percentage normal weight. This figure is the actual weight of the child expressed as a percentage of the average weight for chil-

GRAPH I



dren of its height, age, and sex. From the literature on child health one might naturally look for the success of a school health-training program to be measured by a reduction in the number of underweight children or an approach of the average normal weight toward 100 per cent. Our figures do not show such a change. They indicate an increase in the rate of growth in both height and weight, but not a fundamental change of body proportions.

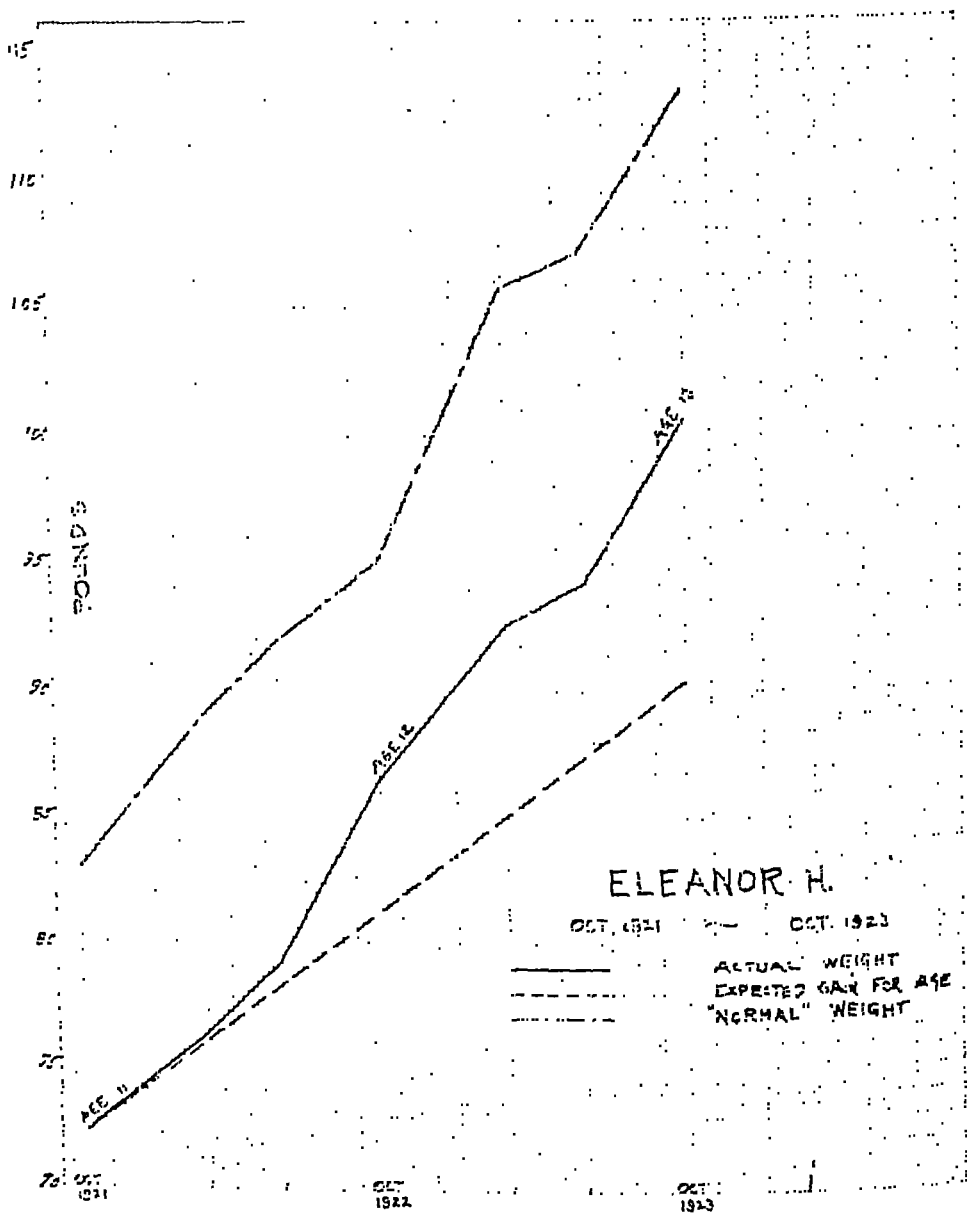
Present space does not allow a consideration of the problem of malnutrition, underweight, and the regular program of weighing and measuring. It is understood that underweight and malnutrition are not synonymous terms, and that often difficulties arise when they are used as such. Lest, however, the following data should imply the conclusion that the weighing and measuring of school children should be done away with, we wish to state that the Malden studies have confirmed our belief that the process of interesting a child in his growth, through regular weighing, is the most valuable single procedure in motivating him toward the adoption of health habits. This is an educational not a clinical process. Underweight figures are useful clinically when properly interpreted and applied. Consistency of growth is also an important and valuable index. Failure to increase in weight during a single month is not significant, but loss of weight or failure to gain over a period of three or more months should cause the teacher to call the attention of the physician or nurse to the child to see whether he needs special attention.

Several of the children studied came out of the underweight group. Many individual charts like that of Lois T., shown herewith, could be produced. Many other children had charts like that of Eleanor H., showing an increase in weight in excess of that expected at the age level, and an unexpectedly rapid increase in height which still left the child underweight. Eleanor was a slender type child who grew rapidly but maintained the same bodily proportions. At the same time, other children fell into the underweight group from higher levels of "per cent normal weight."

Each child's "normal" weight, or percentage of average weight, was computed in October, March, and June of the first year, and at similar dates for the second year, in the case of the experimental group. The absence of height data for part of the control group during the second year made impossible the computation of average weight percentages.

One of the first things to note is a seasonal variation in underweight. In June, 1922, 9 of the children who were in the 10 per cent underweight group the preceding October, had come out of that group,

GRAPH II



but 17 children who were not 10 per cent underweight in October had dropped into the 10 per cent underweight group. Similarly in the control group, 11 children came out of the underweight group during the school year, but 19 children dropped into the underweight group. In both the experimental and control groups we find, therefore, 8 more children in the 10 per cent underweight group in June than in October.

Table II shows the average percentage normal of groups 1 to 8 in both experimental and control children during the school year 1921-1922. While these changes are not consistent it will be noted that the average per cent normal is lower in June than in October, and we shall see later that this seasonal fluctuation is greater than the fluctuation from one year to another.

TABLE II
AVERAGE PER CENT NORMALS—1921-22
Boys

Group Number and Number of Children in Group		October		March		June	
Expt.	Contr.	Expt.	Contr.	Expt.	Contr.	Expt.	Contr.
33	(1) 25	86.72	86.51	87.86	87.43	86.40	86.71
67	(2) 56	95.01	94.83	95.81	94.79	94.17	93.25
28	(3) 22	104.70	103.83	104.77	102.31	102.72	101.13
4	(4) 4	123.65	128.55	125.55	129.55	124.10	126.97
GIRLS							
44	(5) 26	85.38	84.50	86.12	85.58	84.37	85.00
58	(6) 46	94.66	95.18	94.53	95.46	92.88	94.29
33	(7) 15	107.93	105.00	108.75	105.10	107.57	105.17
6	(8) 8	136.00	134.41	133.31	132.48	132.75	130.81

In October, 1922, 17 of the 77 underweight health education children were out of the 10 per cent underweight group, but 5 who were not in the group at the beginning had dropped back into it. Comparing one October with the next, then, we have a reduction of the number of 10 per cent underweight children from 77 to 65. This is not significant, however, for, by reference to individual records, it is seen that several of the children who have gone out of the 10 per cent underweight group have not gone very far above the 90 per cent figure. Comparing one June with the next we find 85 children in the underweight group in 1922, and 88 children in the underweight group in 1923.

A study of individual children shows a continuous plus and minus variation in the child's relationship to normal at succeeding weighing

and measuring periods, due to the roughness of the measure and the inexactness of the method of determining this figure; but our data do not present significant evidence of a reduction in the number of underweight children. A similar situation is found when we deal with small groups like an individual class of boys or girls. When we combine the "per cent normal" figures for a large number of children who are individually varying in both plus and minus directions from time to time, the average tends to remain constant.

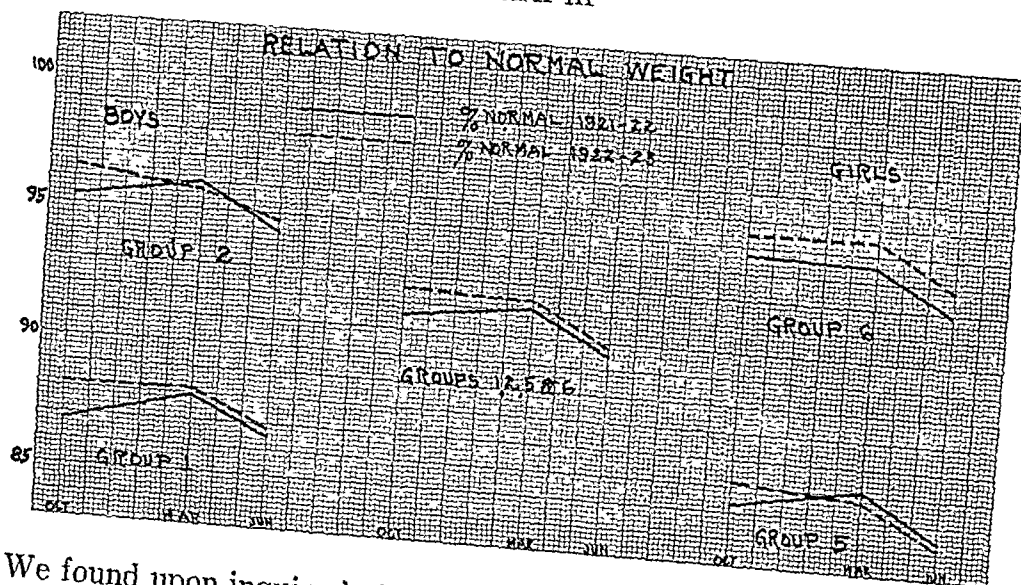
Table II does not show a significant change in the percentage of underweight when experimental group children are compared with control group children. In Graph III for Health Education Children, shown herewith, group 1 (boys more than 10 per cent underweight), group 2 (boys from 1 to 10 per cent underweight), group 5 (girls more than 10 per cent underweight), and group 6 (girls from 1 to 10 per cent underweight) are compared during the two years of the study. The averages for *all* underweight health education children were combined in the curves shown at the center of the graph. It will be seen that this group of children who were underweight in October, 1921, were slightly nearer normal during the school year 1922-1923 than during the school year 1921-1922. The seasonal variation, however, is greater than the difference between the two years.

When we make a statistical analysis of the figures, moreover, we find that they are not significant. The statistical analysis of the figures for March, 1923, and for March, 1922, shows the average percentage normal for 202 children in the control group in March, 1923, to be 92.222, while the average for the same children in March, 1922, was 92.037. The difference of these averages is 0.18. The probable error of the average for 1923 is ± 0.31 and the probable error for the 1922 average is ± 0.26 . The probable error of the difference is ± 0.404 while the difference itself is only 0.18. No significance statistically, therefore, can be attached to this finding.

By comparing the averages for the two October computations we find their difference to be 1.08 and similar data for the two June studies show the difference to be 0.36. Since the average per cent normal figures remain essentially the same, the probable error of the difference between these last mentioned figures would not be greatly different from that computed (± 0.404). We see, therefore, that, although the underweight children having a health education program average slightly nearer normal weight during the second year than during the first year, the difference is not great enough to be significant when the usual statistical measurements are applied.

The whole picture needs to be kept in mind in this connection.

GRAPH III



We found upon inquiry in February, 1925, that 23 of the 77 children who were 10 per cent underweight at the beginning of the study were left in our schools. The rest had moved away. Of these 23 children, 10 were still in the 10 per cent underweight group (9 girls and 1 boy). Figures like these when quoted by themselves make it seem that the health program may greatly reduce the number of underweight children. When, however, one looks at the wide fluctuations in percentage normal for individual children over succeeding years, when one sees that the size of the group stays about the same, when he contemplates the lack of precision in computing the percentage normal figure in the first place, and when he applies actual statistical methods to such figures as those we have obtained, he cannot conclude that health education will do away with the group of underweight children.

Specific studies have been made upon the significance and limitations of the underweight figure as applied to the individual child and as applied to the group. Space does not permit reporting them here.

SUMMARY AND CONCLUSIONS

Growth records were carefully and accurately taken over a period of 20 months from 273 children under the influence of a reasonably intensive health education program and from 202 children in a comparable control group who continued in the usual school program without any special training in health beyond that previously given. The health education program proved to be a sound, practicable and acceptable public school procedure. Definite improvement in health habits was shown.

The rate of gain in both height and weight for the children receiving health education was measurably and significantly greater than for the children in the control group.

Individual children came out of the underweight group. Seasonal fluctuation in the amount and extent of underweight was shown. Significant and statistically measurable changes in the underweight status of the group as a whole were not shown.

More healthful habits of living, resulting from the health education program, produced an improved rate of growth, but not a fundamental change in the height-weight ratio.

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NOTE: All original data for the study here reported are on file in the library of the Massachusetts Institute of Technology.

Public Health Training in Great Britain

IN a recent issue of the *Medical Officer* the history of public health training by universities and medical schools of the British Isles is given. The University of Edinburgh was the first medical school in Great Britain to institute a degree of public health, and the first graduation of sanitarians was in 1875. That same year the University of Cambridge established the conditions for the award of a diploma in public health. As early as 1874 the Senate of the University of London passed a resolution that a certificate in public health should be awarded, and in October, 1888, it resolved that a degree of M.D. in State Medicine should be instituted. The Royal College of Physicians, London, first granted a certificate in hygiene in 1885 and two years later this was changed to a diploma, granted jointly by the Royal College of Physicians and the Royal College of Surgeons of England. The University of Aberdeen conferred its first diploma in public health in 1887 and the joint faculties of the Royal College of Surgeons and Physicians of Glasgow in 1890. Oxford University conferred its first public health diploma in 1898. The University of Glasgow instituted the degrees of B.Sc. and D.Sc. in public health in 1903, but it was not until 1905 that the B.Sc. degree was granted and the first D.Sc. degree in 1912.

The graduate in medicine from the University of Edinburgh has to specialize more or less for a period of two years before he can enter for the final B.Sc. degree and a period of five years must elapse before he enters for the D.Sc. degree in public health.

During recent years many women graduates from medical colleges have entered the public health service.

A Fallacy in the Standard Methods of Examining Disinfectants

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THE three most commonly used tests for determining the germicidal efficiency of disinfectants are the Hygienic Laboratory,¹ the Rideal Walker,² and a modification of the Rideal Walker method,³ employed in the Regulatory Branch of the U. S. Department of Agriculture. In all these tests, a loopful of disinfectant, containing the test organism, is transferred to broth and the survival of the organism determined by noting the appearance of turbidity in 48 hours. In the Rideal Walker method, a 3 mm. loop is transferred to 5 c.c. of broth. In the others, a 4 mm. loop is transferred to 10 c.c. of broth. So, in all cases, a certain amount of disinfectant exists in the broth and, should the quantity be large enough to inhibit growth, a false reading will result.

Usually, this condition does not occur. For the loop carries over very little disinfectant. Thus, Abbott⁴ calculated that the loop used by him averaged 2,000 to the c.c. and that one loopful of a 1-1,000 dilution of corrosive sublimate made a final concentration of 1-20,000,000 when transferred to 10 c.c. of broth. Churchman⁵ stated one 2 mm. loop in 7 c.c. of broth made a dilution of 1-70,000.

And, from this data, one might conclude by means of the pi. r. square formula, that the 4 mm. loop, used in the Hygienic Laboratory and Department of Agriculture methods, should equal a dilution of about 1-25,000 and the 3 mm. loop, employed by the Rideal Walker test, should make, approximately, a 1-22,000 concentration. For practical bacteriostatic work, the two dilutions would be equivalent.

But, unfortunately, other factors modify this calculation and the caliber of the wire, the manner of making the loop and the thickness of the film of liquid will cause a very large variation. Two 4 mm. loops, fashioned by two separate individuals in this laboratory, measured, respectively, 130 and 170 to the c.c. and a conservative estimate would put the dilution, produced by adding the standard 4 mm. loop to 10 c.c. of broth, at not greater than 1-2,000. Even so, when we apply these figures to phenol in the solution of 1-60, commonly used against *M. aureus*, it is evident that the dilution of 1-120,000, obtained by adding one 4 mm. loop to 10 c.c. of broth, would be far too weak to have any effect.

However, phenol, although a reliable germicide, has little bacteriostatic power. Especially is this true when it is employed against *M. aureus*, the coccus that is employed to test the efficiency of products designed to disinfect wounds. It is possible to grow the strain which can be obtained from the Department of Agriculture in a dilution of 1-300 phenol and, in consequence, it is obvious that the phenol, supposedly acting as a control, could not inhibit the growth of *M. aureus* in the dilution mentioned.

But, in contrast to this weak bacteriostatic action, Abbott demonstrated that corrosive sublimate suppressed growth of this organism in peptone broth in 1-75,000 dilution and, when the broth was made without peptone, in a dilution of 1-200,000. Its germicidal power was comparatively weak, as it failed to kill *M. aureus* in 1-1,000 dilution in 20 minutes. And the author, uniformly, has obtained some bacteriostatic action in dilutions of over 1-100,000, using the broth specified in the method of the Department of Agriculture.

Now, these results are produced by transferring a 4 mm. loop or about 1/200 c.c. of a vigorous, 24-hour culture to broth containing bichloride. But, in the test, the culture first is diluted by adding 0.5 c.c. of culture to 5.0 c.c. of disinfectant, or a concentration of 1-10, so that only 1/2,000 of a c.c. is transferred and the organisms are no longer vigorous, since they have undergone treatment, for from 5 to 15 minutes, with bichloride. The fewer the number of organisms transferred and the greater their attenuation, the greater will be the bacteriostatic action of the bichloride and thus it may be expected to act in far higher dilutions, probably in one to several millions.

In order to overcome this source of error, a simple modification of the regular tests was performed. Four loops were transferred from each of the broth preparations to fresh tubes of this medium, the dilution of bichloride in the latter, thereby, being rendered infinitesimal.

TABLE I

Dilution of Bichloride	Time of Exposure in Minutes		
	5	10	15
1-100	0	0	0
Transfers 1-100	X	0	0
1-500	0	0	0
Transfers 1-500	X	X	X
1-1,000	X	X	0
Transfers 1-1,000	X	X	X
Dilution of Phenol			
1-60			
Transfers 1-60	X	X	0
1-70	X	0	0
Transfers 1-70	X	X	X
	X	X	X

With this modification, the efficiency of bichloride was determined by the Department of Agriculture method, at a temperature of 20° C., against *M. aureus* as test organism, with the result seen in Table I.

This experiment indicated that the method is misleading when used to determine the germicidal efficiency of mercuric chloride against *M. aureus*, for, when no sub-transfers were made, the substance appeared to kill the coccus in 1-1,000 dilution in 15 minutes, while, on the contrary, growth in the sub-transfers showed that the organism really survived after treatment for 15 minutes with a 1-500 solution.

At the same time, it should be noted that the phenol control failed to kill *M. aureus* in a 1-60 dilution in 10 minutes, although no turbidity arose in the sub-transfers after 5 minutes. This result we should expect in the case of a germicide having little bacteriostatic ac-

TABLE II

Dilution of Bichloride	Time of Exposure in Minutes		
	5	10	15
Department strain			
1-100	0	0	0
Transfers 1-100	X	0	0
1-200	0	0	0
Transfers 1-200	X	X	X
1-300	0	0	0
Transfers 1-300	X	X	X
1-400	0	0	0
Transfers 1-400	X	X	X
1-500	0	0	0
Transfers 1-500,	X	X	X
Dilution of Phenol			
1-60	X	0	0
1-70	X	X	X
Strain "L"			
Dilution of Bichloride			
1-100	0	0	0
Transfers 1-100	0	0	0
1-200	0	0	0
Transfers 1-200	X	X	0
1-300	0	0	0
Transfers 1-300	X	X	X
Dilution of Phenol			
1-60	0	0	0
1-70	X	X	X
Strain "P"			
Dilution of Bichloride			
1-100	0	0	0
Transfers 1-100	X	0	0
1-200	0	0	0
Transfers 1-200	X	X	X
1-300	0	0	0
Transfers 1-300	X	X	X
Dilution of Phenol			
1-60	0	0	0
1-70	X	X	0

tion, for, here, the smaller number of organisms in the second set of tubes would tend to make the reading higher in the first set, in which the small amount of phenol present would have no power of inhibition.

The finding in regard to bichloride was confirmed on several occasions. Five strains acted alike and survived a 1-500 dilution for 15 minutes and, finally, the Department of Agriculture strain and two others, freshly isolated from human infections, were tested against solutions, ranging from 1-100 to 1-500, with result shown in Table II.

Apparently, mercuric chloride does not always kill *M. aureus* in 1 per cent dilution in 5 minutes, nor in $\frac{1}{2}$ per cent dilution in 15 minutes, although its bacteriostatic action, which is not eliminated by the unmodified method, will make it seem to kill in very much weaker concentrations. This source of error was found to apply to other preparations, mercurial and non-mercurial, possessing great inhibitory power. Table III gives the result of a test made on a sample of gentian violet.

TABLE III

Gentian Violet Dilution	Time of Exposure in Minutes		
	5	10	15
1-10	0	0	0
Transfers 1-10	X	X	X
1-100	0	0	0
Transfers 1-100	X	X	X
1-1,000	X	X	X
Transfers 1-1,000	X	X	X
Phenol Dilution 1-60	X	0	0

Here, the unmodified method indicated that gentian violet kills *M. aureus* in at least a 1 per cent concentration, in 5 minutes, while the sub-transfers proved that the organism survived a 10 per cent solution for 15 minutes.

Conclusions—The method for testing germicides, employed in the Department of Agriculture, is not applicable to preparations with high bacteriostatic power, unless modified by the addition of sub-transfers.

There is no reason to believe that the Rideal Walker and Hygienic Laboratory methods would give more accurate results.

Mercuric chloride fails to kill *M. aureus* at 20° C. in dilutions of 1-200 to 1-300 in 15 minutes.

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How Bridgeport Reduced Its Infant Mortality

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WHEN in 1918 the slogan "Save a hundred thousand babies" was promulgated, the City of Bridgeport, Conn., was among the first to take up the call. Looking back at an infant mortality rate of 109 for the 5 years, 1911-1915, and noting the number of deaths from gastrointestinal diseases, particularly during the summer months, the nurses of the local Visiting Nurses Association and four nurses from the Department of Health visited as many babies as possible during the summers of 1918 and 1919 in an attempt to reduce the number of infant deaths from that cause.

To be sure, this was a sporadic effort, but during the 3 years, 1918-1920, the work was further systematized with the opening of a milk station and summer well baby stations. The latter were well attended at first, but it soon became apparent that to make the fullest use of them it would be necessary to have a physician in attendance, as the number of visits fell off rapidly when the mothers found no doctor there to advise them. During this period the rate fell from 99.5 in 1918 to 92.1 in 1920, with a marked decrease in the deaths during the summer months.

Bridgeport is almost exclusively a manufacturing city. In 1920 it had a population of 144,000, of whom one-third were foreign born, with Italians, Poles, and Hungarians predominating in that group. The midwife did practically all of the obstetrical work among these women, attending as a matter of fact over one-third of the deliveries in the city.

At the beginning of 1921 the Department of Health definitely took over the infant welfare work with the avowed purpose of further reducing the infant mortality. The question then arose as to what might be the best method of establishing contact with the mothers and of following the babies through their first year of life.

The health officer in Bridgeport is the registrar of vital statistics. It was decided to have nurses from the department deliver birth certificates to the mothers as soon as possible after the registration of

births. To this end the city was divided into districts, with a nurse in each; well baby stations or, as they are called in Bridgeport, health stations, were opened in school buildings in different parts of the city. There are 5 stations today. Four are open one afternoon a week and another in a densely populated Italian district two afternoons a week. There is a doctor in attendance at each station.

At the outset the personnel of the newly organized division of infant welfare consisted of a director, a supervisor, 8 nurses and a clerk. The nurses in addition to performing the duties connected with the infant welfare program also did the communicable disease work. At no time have the nurses done infant work alone.

As time went on, a separate group of nurses was employed for communicable disease activities and the infant welfare and medical school inspection divisions were merged. That is how the organization is maintained at present.

Today the division is made up of a director, 2 supervisors—1 for each activity—22 nurses and 2 clerks. The city has been divided into 20 districts with a nurse in each. The nurse is responsible for all the child hygiene work in her territory, including that for the infant, the preschool and the school child. For the outlying districts an automobile is provided. The 2 remaining nurses are for relief.

During the school term the nurses spend the mornings in the schools and the afternoons in the field making such school home calls as are necessary, following up the infants, or are in the health stations. During the summer months, they are not engaged in infant work alone, but carry on any special activity that may be undertaken. For some years extra health stations for preschool children were opened during the summer months, but for the last two years this time has been used to a great extent in a toxin-antitoxin and Schick testing campaign.

Since the beginning, the main idea has been to get the coöperation of the mothers. When the nurse delivers the birth certificate to the mother she at the same visit gives the first of a series of 12 monthly letters. She explains the purpose of the infant welfare work, tells of the health stations, and talks over the general care of the baby.

The letters of the series are very simple. They are dated "Baby's First Month," and so on, up to the 12th month. They tell of certain common dangers to and certain common measures for the baby's health, what the mother may expect of the average child at different times, and urge her to seek advice from the family doctor at once when anything unusual develops in the infant's condition.

At the health stations the babies are weighed and measured. The doctor in attendance examines those brought to him, supervises feed-

ing, and prescribes for minor ailments. Physicians' private patients are referred back by the nurse. Children found ill are sent to their own doctor or to such agency as the doctor may think best suited to care for those particular children. The importance of breast feeding is emphasized and premature or unnecessary weaning is often prevented. Attempts are made to bring home the idea of keeping the baby well.

This work has now been carried on for 7 years. What has been accomplished?

To be sure there had been a downward trend in the infant mortality rate before the Department of Health made any special effort to lower it. The average rate from 1911 to 1915 was 109. From 1916 to 1920 it was 93.1. For the year 1920 it was 92.1. Since the department began the work the rate has not been above 80. The average rate for the last 7 years is 63.3. For 1927 it was 42.5, the lowest ever recorded for the city. Had that for 1927 been the same as 1920 there would have been 288 deaths in that year instead of 133.

TABLE I
DEATHS PER 1,000 BIRTHS FROM THE FIVE PRINCIPAL CAUSES

	1920	1921	1922	1923	1924	1925	1926	1927
Prematurity	18.9	13.1	11.4	11.7	15.2	12.4	17.3	12.4
Respiratory Diseases	18.9	10.2	13.5	15.3	10.0	10.1	13.7	6.0
Congenital Malformations	10.2	6.8	5.8	8.2	4.5	6.4	4.2	3.5
Birth Injuries	5.2	5.8	3.5	8.8	4.8	7.6	6.5	4.4
Enteritis	16.9	9.9	5.8	3.0	2.4	3.5	4.2	0.9
Infant Deaths	385	271	220	261	183	164	223	183
Births	4178	4116	3406	3265	3282	3063	3055	3123
Infant Mortality Rate	92.1	65.8	64.5	79.9	55.7	53.5	79.2	42.5

It will be seen that there was a rise in 1923 to 79.9 and that there was in that year a rise in the rates for prematurity and the respiratory diseases. Respiratory complications accompanying or following measles were the cause of 20 infant deaths. The rate for prematurity was the highest since 1920.

Again in 1926 there was a rise to 79.2, almost as high as in 1923, and once more there was a rise in the rates for prematurity and the respiratory diseases. In 1927 with the lowest rate in the history of the city there was a drop in the rate for prematurity and a surprising drop in that for the respiratory diseases.

In Bridgeport the gastrointestinal diseases as causes of death are almost negligible, due in large measure to the fact that 95 per cent of the milk sold in the city is pasteurized. Prematurity and the respiratory diseases remain the two principal causes of infant deaths.

Just how the respiratory disease rate can be lowered is a, or the, question. The nurses in their visits stress the importance of guarding

against and promptly treating colds. There may be no satisfactory treatment for a cold, but mothers can understand that rest in bed and forcing fluids may do something to prevent the development of a more serious respiratory complication. Mothers are urged to call the doctor early in these cases and every endeavor is made to educate them to a realization of the fact that the common cold is a source of danger.

Statistics alone may not be a satisfactory index of the quality of the work done, but the number of calls gives a good idea.

Infant welfare calls were as follows: 1921, 18,412; 1922, 41,971; 1923, 50,079; 1924, 60,876; 1925, 57,247; 1926, 52,333; and 1927, 62,024.

From the beginning, the health stations have been well attended. During the entire time over 30 per cent of the babies born and residing in the city have been registered at these stations. The attendance and new registration is shown in Table II.

TABLE II
HEALTH STATION ATTENDANCE

	Total	Under 1 Year	New Registration under 1 Year
1921	6,258	4,824	
1922	7,107	5,020	1,028
1923	7,422	4,813	972
1924	7,560	5,156	975
1925	8,833	6,355	985
1926	6,930	4,876	747
1927	9,280	6,079	876

The budget for the Division of Child Hygiene in 1927 was \$41,340.00. Taking one-half for infant welfare work gives that branch \$20,670.00, which makes the cost of keeping in touch with the baby at home and at the Health Stations 28.9 cents per visit. This figure has been made possible by eliminating special nurses for the different phases of child hygiene work and having each do her part in the program as a whole.

SUMMARY

The Department of Health of Bridgeport has been trying to reduce the infant mortality rate for the last 7 years. It started this undertaking with a corps of 9 nurses, and today employs 22. Only a part of their time is devoted to this work. During this period the rate has fallen from 92.1 in 1920 to 42.5 in 1927, with rises to 79.9 in 1923 and to 79.2 in 1926, attributable to increases in the deaths from respiratory diseases. These and prematurity are the outstanding causes of infant mortality, and for further reduction special endeavors must be made in this direction. The cost of following up an infant in 1927 was 28.9 cents per visit.

Diphtheria, Its Treatment and Prevention

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A STUDY of diphtheria mortality during the past half century in the states, provinces and cities of the United States, Canada and Europe was made to learn:

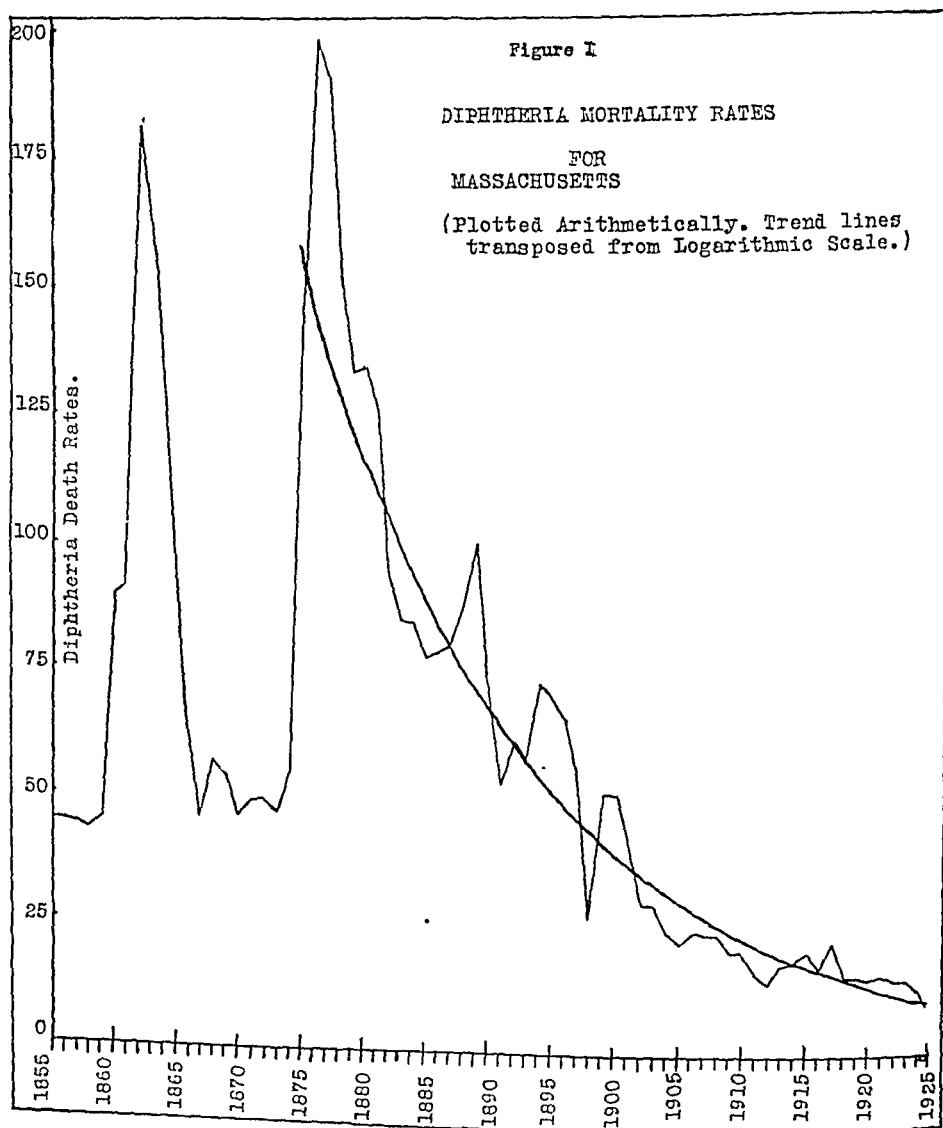
1. The extent of diphtheria mortality and its variation from year to year
2. The effect on diphtheria mortality due to the use of antitoxin
3. The extent of the use of diphtheria immunization
4. Its effect on diphtheria mortality

For the purpose of this study, data have been plotted on semi-logarithmic paper in order to demonstrate the trends in the various data. Diphtheria death rates, in common with many biological data of progressing or regressing events, follow a curvilinear trend, so that when the same data are plotted on semi-logarithmic paper the trend becomes a straight line. Therefore, semi-logarithmic paper is the paper of choice, or plain cross-section paper may be used on which one can plot the logarithms of the data. The resulting graphs will be identical. Diphtheria mortality rates for Massachusetts, plotted on plain cross-section paper, Figure I as numbers, and Figure II as the logarithms of the data, illustrate this point.

It is now about 33 years since diphtheria antitoxin was given to the world as a specific treatment for diphtheria. Prior to 1895, the crude death rate from diphtheria was around 100 per year with a wide range of variation, differing in different communities; physicians watched with dread, and were helpless to combat the rapid and fatal course of this disease. But with the introduction of antitoxin, the scene was changed. Men who had many times stood helplessly by and beaten, now, by the aid of this wonderful new specific, were able to treat with success. They watched with justifiable pride the rapid clearing of the membrane and dramatic recovery of the patient.

Hospitals saw their diphtheria mortality rates cut in two, following the introduction of antitoxin, and apparently a new day had dawned in which diphtheria, the great scourge of pediatrics, was to be laid low and fade off into history as an awful nightmare.

Since 1895, the use of diphtheria antitoxin as a therapeutic agent

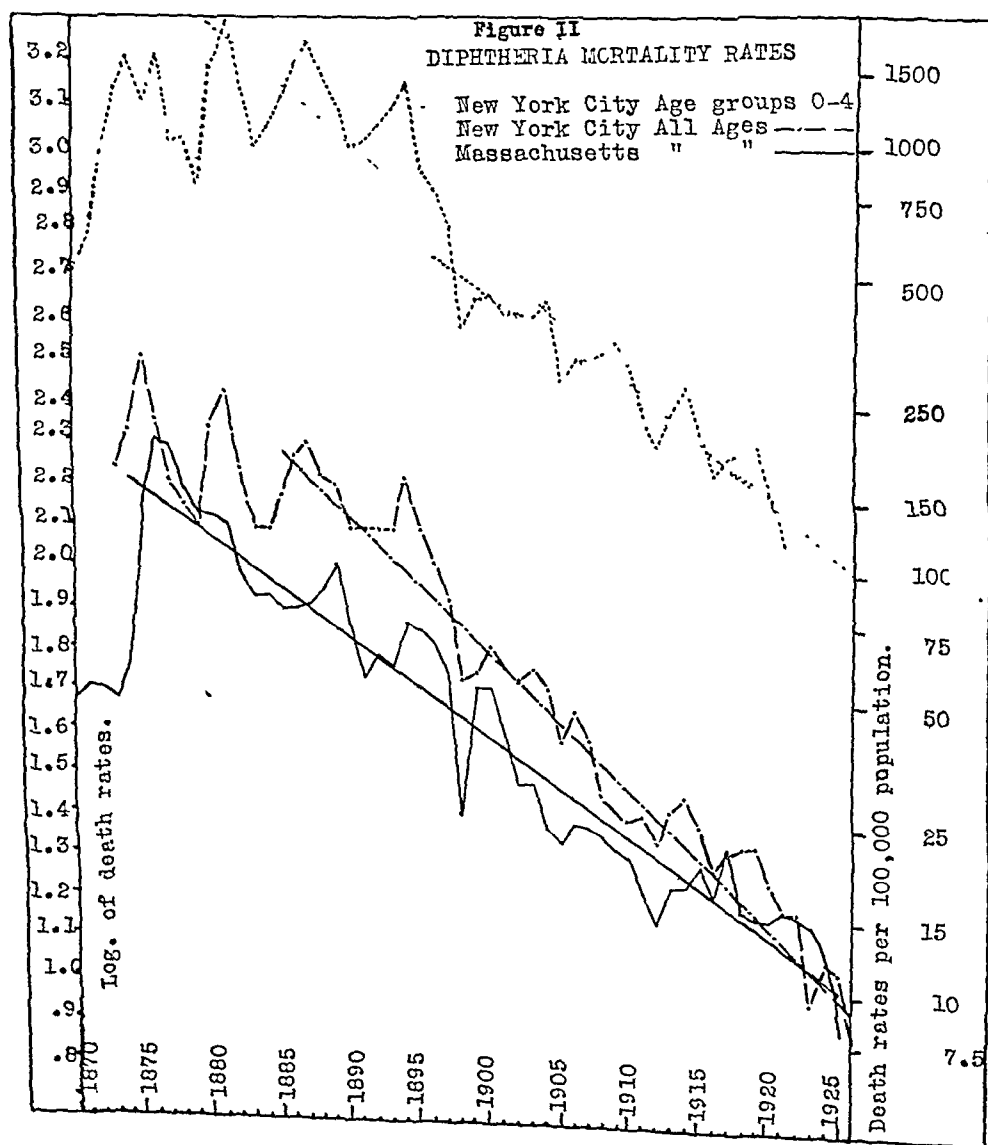


has become practically universal. It was rapidly adopted by the profession and accepted by the laity. Year by year cases were seen, diagnosed and treated earlier, and with larger doses of serum, and yet diphtheria is with us still and is one of the chief causes of death from acute infections in childhood. We often point with pride to our declining mortality rates and show how we are conquering diphtheria. Occasionally when we get a run of luck and find a series of years showing a marked downward slope in mortality rates, we get quite beside ourselves in our enthusiasm over how we are bringing down our diphtheria mortality.

Now after a period of 33 years of experience with the use of anti-

toxin let us pause and look back over our trail and consider whether we have taken full advantage of the opportunity afforded by so potent a drug as antitoxin. Is diphtheria as thoroughly beaten as we had reason to expect 33 years ago? If not, then, why not? What have we done to eradicate diphtheria since the introduction of active immunization? Have we made the most of our opportunities in that respect? If not, why not?

In a paper read before the National Academy of Science, November 9, 1926, Doering showed that diphtheria rates in Massachusetts from 1875 to 1925 fall about a trend line within the range of chance distribution, and the trend is certainly not markedly changed in direction when passing through the period following 1895.



What Doering found to be true for Massachusetts is also true, in a general way, for other countries, states and cities. If data showing diphtheria mortality rates extending back to 1870 or further, for large communities, are plotted, one can see that there are two general trends. The first, in respect to time, can be drawn forward and is found to leave the course of mortality-rate-frequencies somewhere between 1890 and 1900. On the other hand, a trend line can be drawn, starting at 1925 and drawing it backward, which will not leave the course of mortality frequencies until about the year 1880 or 1890. In no instance do the data of diphtheria mortality rates show a marked drop in their trend when passing into the range of influence of the therapeutic use of diphtheria antitoxin.

Observe the graphs in Figure II. Note that the trend of the data for Massachusetts has been continuously downward at an unvarying slope for 20 years prior to the introduction of antitoxin in 1895 and since, to date. In New York City, where the factor of population density would obviously influence the mortality rates from any communicable disease, the tendency for the mortality rates to fall was not noticeably marked until 1894, but note that a trend line can be drawn in from 1885 to 1925, and throughout its extent the mortality frequencies fall well within the range of chance deviation from the trend line.

Observe the upper dotted line representing mortality rates for the 0-4 age group in New York City. Two lines are drawn in showing two possible trends. The shorter line fits the data more closely and, if accepted as the true trend of the data, then it is apparent that the introduction and use of antitoxin in 1895 was responsible for the drop in death rates from 1894 to 1898 which was relatively greater in the 0-4 age group than in the city at large. On the other hand, with an increase in the use of antitoxin the fall in rates from 1898 to 1921 was less rapid in the 0-4 age group than in the city as a whole. The writer believes that the longer line gives a more accurate picture of the general trend of the fall of the mortality rates in this age group. In only three instances do the mortality frequencies vary more than twice the standard deviation from the trend line, and that only prior to 1900, since when diphtheria mortality rates have tended to become more stable due no doubt to the use of antitoxin. Such a trend conforms more to the general trends in other states and cities. If the longer line is accepted as the probable trend of the data for this group, then one must concede that although, without a doubt, antitoxin has been a real influence in the lowering of death rates there are other factors operating toward the same end.

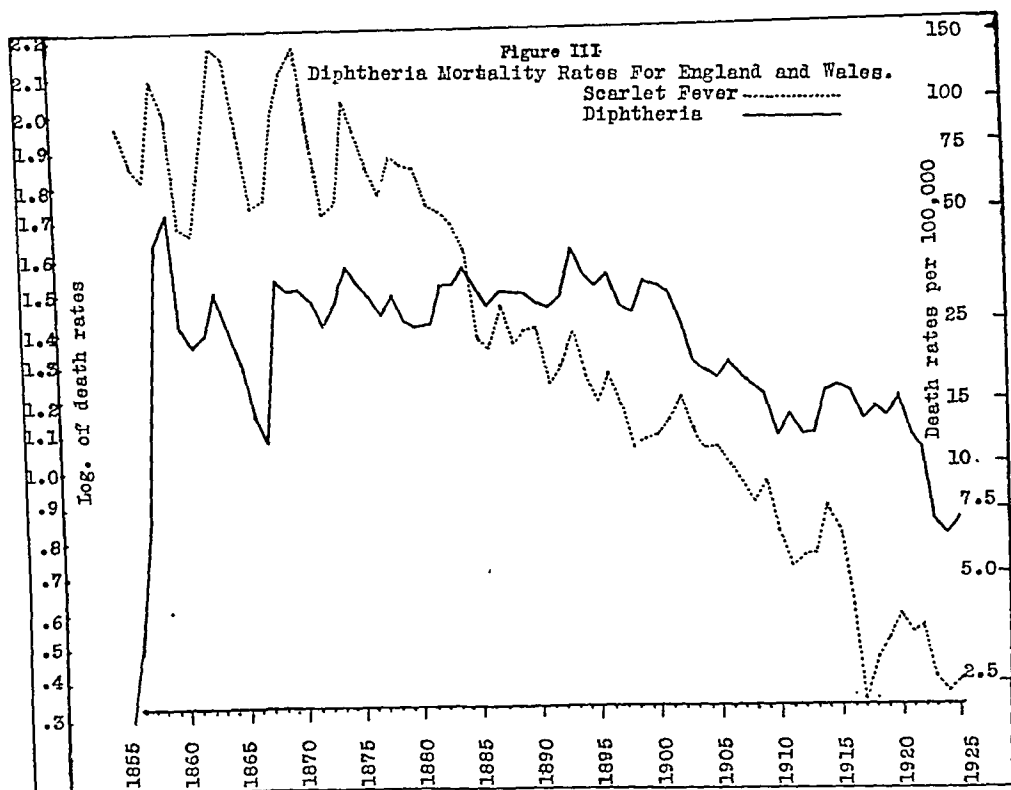
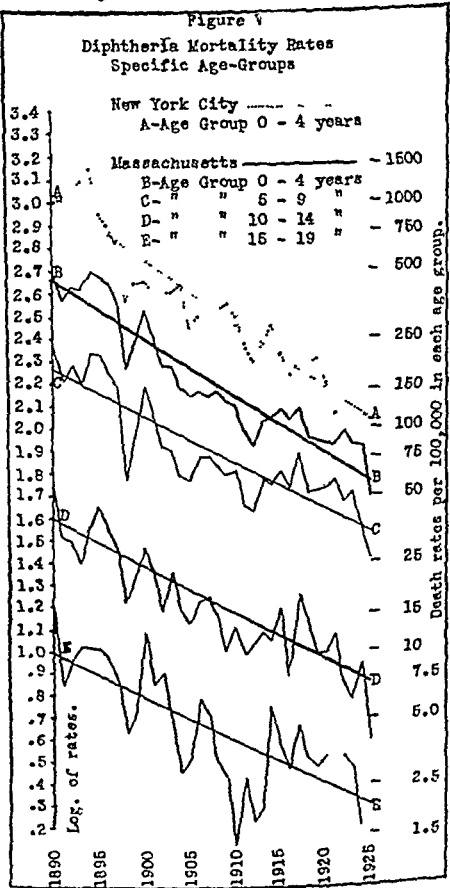
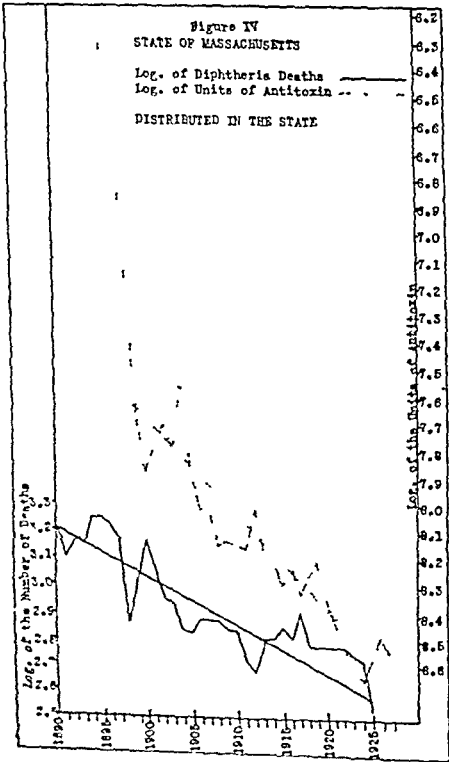


Figure III for England and Wales is of special interest because of the stability of the data, due to the size of the population (35,000,000). There is a fall in the trend representing a fall in death rates from approximately 35 to 10. Is this fall in diphtheria mortality rate the fall one would expect following the universal use of so specific a drug as diphtheria antitoxin? True, the change in trend begins in the region of 1895, but mark also that scarlet fever, for which there was at that time no specific treatment or preventive, has been falling along a trend practically parallel to that of diphtheria. Smallpox also is much less virulent now than it was in the last century. Diseases tend to wax and wane in their prevalence and virulence. Has diphtheria fallen because of our use of antitoxin, or would it have fallen without it? Has diphtheria become less prevalent than it used to be? It is doubtful. Is it less virulent, or is the population less susceptible than in the last century? The answer is necessarily a matter for conjecture.

Why is it that Toronto, Ont., and Cleveland, O., are having diphtheria death rates around 20, while the average for the country as a whole is around 8 or 9? Both are university cities with medical men second to none. Both have antitoxin in unlimited quantities. Why are most of the cities about the Great Lakes having such high death

rates from diphtheria? In other words, how much are we actually controlling diphtheria, on a country-wide basis, by means of treatment?

In Figure IV, the data showing diphtheria deaths in Massachusetts since 1890 are plotted against data showing units of antitoxin produced by the biological laboratories of Massachusetts. The latter data are inverted to show the relation in the trends for both data. It is not safe to draw conclusions from one state only. It is offered here only because it is of interest. Note, however, that in spite of the tremendous increase in the use of antitoxin the trend of the deaths continues unchanged from that prior to the introduction of antitoxin. The value of antitoxin in the treatment of diphtheria has long since passed the experimental stage and needs no verification here. Probably if every case of diphtheria were seen early enough, diagnosed and treated with an adequate dose of antitoxin, there would be few if any deaths. Why then do not mortality rates show more evidence of this effect of antitoxin? The following illustrates one reason. The treatment of diphtheria is necessarily intimately bound up with a large human factor, and human nature is naturally prone to err. Early and



adequate treatments are essentials of successful therapy in diphtheria. The onset of diphtheria is often so insidious that the case is well advanced before the mother is sufficiently alarmed to call a physician. Physicians are only human and have been known to miss the diagnosis. Too often the physician delays treatment while he waits for a laboratory report on the throat smear. The laboratory is operated by human beings and they, though usually right, have also been known to be in error. After the diagnosis, the treatment varies—another human factor.

Since 1926, the writer has studied 297 diphtheria deaths in Indiana. A similar study of 500 diphtheria deaths in New York State was made by Roberts. Together the findings are in part shown in Table I.

TABLE I
STUDIES OF 797 DEATHS FROM DIPHTHERIA

	New York Per Cent	Indiana Per Cent
Physician called after third day of illness	40.0	49.5
Antitoxin administered in repeated doses	33.0	39.7
Antitoxin not given at first visit	40.0	35.0
Antitoxin not given at all	10.6	10.0

On the basis of the above studies of 797 deaths in two states, over 40 per cent of the deaths followed late treatment, and, together with 10 per cent that did not get any antitoxin, make up half the deaths. In over one-third of the deaths, antitoxin was not administered on the physician's first visit. In these cases, after the physician was called, he apparently waited on the laboratory report or missed the diagnosis on his first call. Another delay, and the most unpardonable sin of all, was that in over one-third of the cases antitoxin was given in repeated doses instead of a single adequate dose. Every physician knows that antitoxin does cure diphtheria patients when given early and in adequate dosage. The reason that mortality data do not show more evidence of the value of antitoxin in the reduction of diphtheria mortality rates is found, not in any lack of potency in antitoxin itself, but rather in our administration of it.

The picture, however, is not entirely black and one must not conclude that because crude diphtheria mortality rates do not as a rule show marked reduction following the use of antitoxin, antitoxin has been a failure. This article is written from the viewpoint of the health officer interested in the state- or nation-wide control and elimination of diphtheria, not from the viewpoint of the physician who is interested in the treatment of an individual case. From the latter viewpoint there is probably nothing in medicine that is nearer 100 per cent perfect than antitoxin in the treatment of diphtheria, when given

early and in adequate dosage; but, on the other hand, judging from our experience of 33 years in the use of antitoxin, it is doubtful whether antitoxin has been anything more than one of several factors operating to reduce the general diphtheria mortality. If one were to look at the plotted data with the dates removed from the graphs, it would be impossible to point to a period and be able to say with assurance, "Antitoxin must have been introduced here or there." The change in trend in the last 50 years has been definite and significant, but gradual, all the way.

Now let us observe the data for specific age groups for Massachusetts since 1890 (Figure V). It will be seen that there has been a marked falling off in the mortality rates of the 0-4 age group. The data for the age groups for 1890 and 1925, changed back to numbers, are given in Table II, averages taken from the trend lines. Note the

TABLE II

1890			1925			Change
Age Groups	Death Rates	Percentage	Age Groups	Death Rates	Percentage	
0-4	462.0	64.8	0-4	58.1	57.3	- 7.5
5-9	199.0	27.9	5-9	34.1	33.7	+ 5.8
10-14	39.8	5.6	10-14	6.8	6.7	+ 1.1
15-19	10.0	1.4	15-19	2.0	2.0	+ 0.6

shifting of the mortality percentages from the first age groups to the 5-9 age group. Is this due to the use of antitoxin or to some other factor? Whatever the cause, it has been, no doubt, a potent factor in reducing the death rates since about two-thirds of the deaths occur in the 0-4 age group.

In the last decade much information concerning diphtheria immunization has been compiled and disseminated. Results of the Schick test have been very well studied, so that now we have very good data relative to the natural susceptibility of the various age groups. A large number of children have been immunized, but unfortunately most of this work has been done among the school children and very little among the preschool population. The school children are easily handled in a general immunization campaign, while it is relatively difficult to get the preschool children to the clinic.

TABLE III

RATIO OF PROBABILITY OF DYING OF EACH AGE GROUP ON THE BASIS OF 10-14 AGE GROUP AS 1

Age Groups	0-4	5-9	10-14	15-20
1890	11.6	5	1	0.25
1925	8.5	5	1	0.3

Table III for Massachusetts shows the relative importance of conducting immunization among the various age groups. Take for example the relative value of the immunization of a child 14 years of

age and one under 1 year. In 1 year the 14-year-old child will be in a relatively non-susceptible group, while the infant will be for 15 years in the relatively highly susceptible age groups. Therefore, during the 5 years the infant is in the 0-4 age group he will be the equivalent of over forty-two 14-year-old children. In the next age group, 5-9, he will be the equivalent of twenty-five 14-year-old children. He will be in the 10-14 age group, for 5 years, the equivalent of five 14-year-old children. Thus the immunization of one infant at 6 months of age is the equivalent of immunizing over seventy-two 14-year-old children, other ages in proportion.

Apply the above to an average city of 100,000 people, with an expected death rate of 10 per annum, and the deaths will be divided approximately as shown in Table IV.

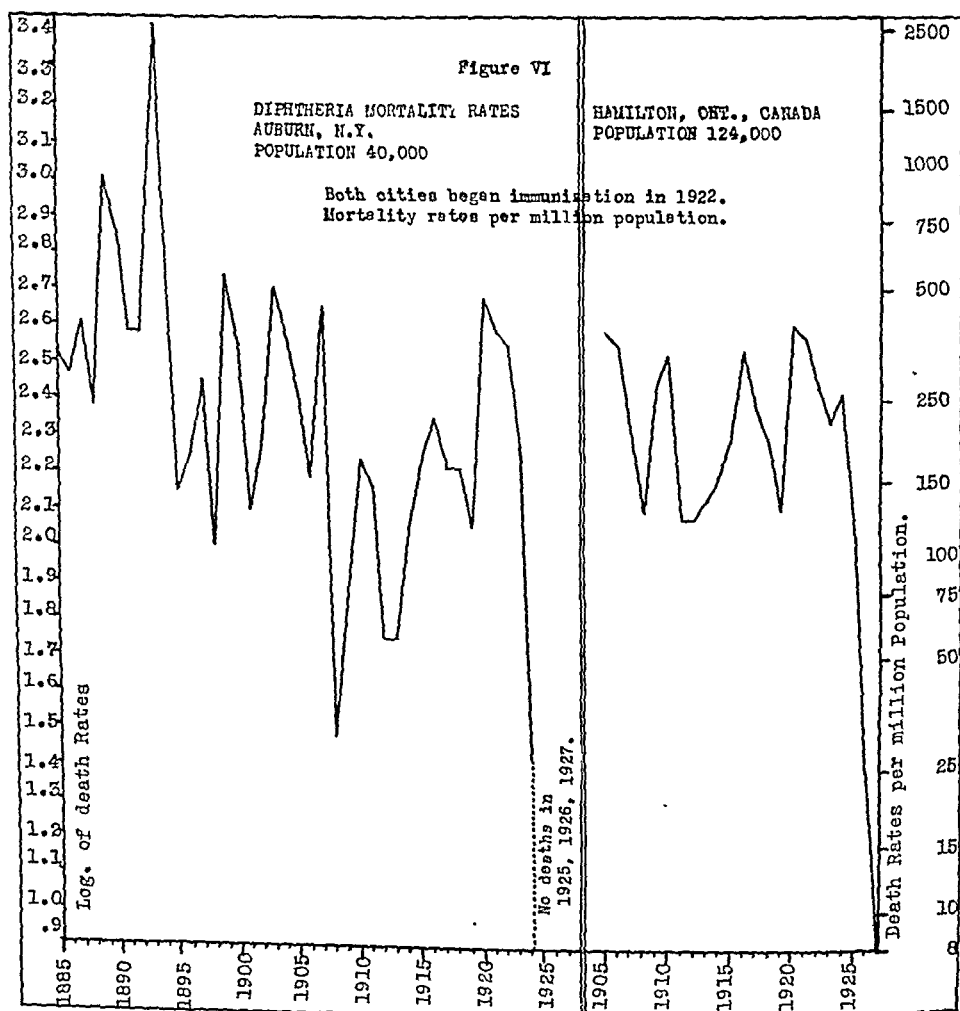
TABLE IV

Age Groups	0-4	5-9	10-14	15-
Populations	10,000	10,000	10,000	70,000
Expected Deaths	6	3 or 4	0 or 1	0 or 1

If we can prevent 1 death in any one age group we will lower the crude death rate by 1. Obviously, if we could protect one-sixth of the first age group, about 1,700, or one-third of the second age group, about 3,300, we could expect to prevent 1 death. If we could immunize 5,000 in each of the first two age groups we would, on the basis of this simple calculation, reduce the deaths by one-half. But, as a matter of fact, the experience of cities, where immunization has been intensively carried out, goes to show that the immunization of half the susceptible children will nearly, if not actually, eliminate diphtheria from the city.

On the other hand, how many children of the 10-14 age group must we immunize to expect a reduction of 1 death? Probably 20,000—and there are only 10,000 in the 10-14 age group—and in the ordinary course of events, without any immunization at all in this age group, there is an even chance that there will be no deaths anyway. In any event, the immunization of all children under 10 years of age will remove the sources of infection, the older age groups will cease to be infected and in this way will take care of themselves.

These simple calculations, though based on the facts of the experience of Massachusetts for 36 years, are purely hypothetical and are offered here merely to show the relative importance of concentrating our efforts in immunization on the most susceptible age groups under 10 years of age. This probably suggests why so much of the immunization work done in the past shows no significant reduction in the crude diphtheria mortality rates.



During the last four or five years many states and cities have experienced a marked fall in diphtheria mortality rates, and likewise many persons have credited it to the immunization work that has been done. This makes propaganda of doubtful value, for in most instances if the data are observed over a long period of time, it will be found that the recent drop is only what we would expect from the operation of chance only. There are exceedingly few communities with data showing significant reduction in diphtheria rates following intensive immunization work.

In this survey the following cities show significant reduction in their death rates following intensive immunization work:

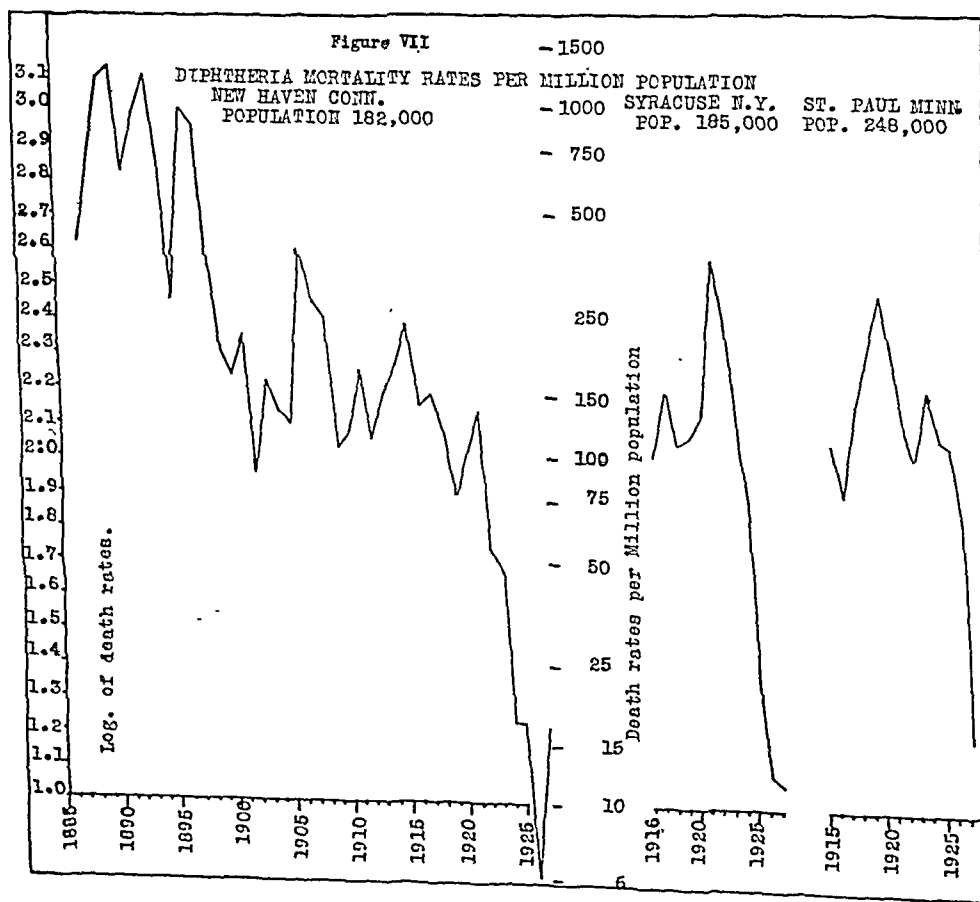
Hamilton, Ont., a city of 124,000 population, began immunization in 1922 since when they have immunized between 20,000 and 25,000 children. Unfortunately more definite data are not available. Children under 15 years of age com-

prise approximately one-third of the population; therefore Hamilton has immunized about one-half of its child population. It is of interest to note that this work has been done with anatoxin and not toxin-antitoxin. Irrespective of the relative value of the two methods of developing active immunization, they work equally well if the work is done thoroughly. In 1927 this city had 11 cases of diphtheria and 1 death. This is a marked and highly significant reduction from the rather high diphtheria mortality rate prior to 1922 as is shown by Figure VI.

New Haven, Conn., is a city of about 185,000 population. They began immunization of their school children in 1923 with the following results: In 1924, there were 11,747 children immunized; in 1925, 9,649; in 1926, 6,888; in 1927, 4,900; making a total of 33,184 children immunized. New Haven has now immunized about one-half of its susceptible population. In 1924 their death rate dropped significantly to 1.7; it was the same in 1925; in 1926 there was but 1 death, or a rate of 0.6; and in 1927 3 deaths, or a rate of 1.6. These figures are quite significant, as can be seen in Figure VII, and future results will be watched with interest.

Syracuse, N. Y., a city of 196,000 population, began immunization in 1923, since when over 23,000 children have been immunized or found immune. Here the child population is about 65,000 under 15 years of age. Their diphtheria death rate has dropped significantly since 1925 (Figure VII).

Auburn, N. Y., with a population of 35,700, has since 1922 immunized or found



naturally immune about 9,000 children. There are probably 12,000 children there under 15 years of age. The death rate dropped in 1924 to 2.7, after which it dropped to zero, where it stayed until January, 1928 (Figure VI). Since then there have been 2 deaths, 1 a child and 1 an adult, both treated with antitoxin late and never immunized. This has rather spoiled the record, through no fault of the public health authorities.

St. Paul, Minn., with a population of 298,000, has immunized nearly 26,000 children since 1924, and although the data, as shown in Figure VII, are over a rather too brief period from which to draw definite conclusions, they look significant. The future alone will show whether this drop is a streak of luck or the result of their immunization. The reports of cases from St. Paul during the past winter seem to indicate a continuance of the downward trend of diphtheria in this city.

Manchester, N. H., has been doing a considerable amount of immunization and will probably get a significant reduction in the next year or so.

Brantford, Ont., a city of about 30,000, with death rates from diphtheria of 7 in the 2 years, 1920 and 1921, dropped to 2 in 1922, zero in 1923, back to 2 in 1924, and has been zero since until 1928. They have immunized to date about 7,600 children. Their data are for too short a period, and their population so small that one hesitates to draw too definite conclusions as to the significance of their results, although what data are available look probably as significant as those of Auburn, N. Y. In 1928, the Health Officer reports 1 diphtheria death, after which 3,204 children were immunized. Our sympathies are all with the child who paid the supreme sacrifice for the negligence of someone, but perhaps, since the death was the means of protecting 3,204 other children from the possibility of a similar fate, the child may not have died in vain.

The dictum of the bloody days of old still holds in the 20th century—"Without the shedding of blood there can be no remission of sin." Surely enough blood has been spilled on the altar of ignorance and neglect to stir this nation into sufficient activity that it will take advantage of the discoveries of medical science which are at hand for the taking, and make the children safe from diphtheria.

Intensive immunization of the population under 10 years of age will control and probably eliminate diphtheria.

SUMMARY

1. Although diphtheria antitoxin, when given early and in adequate dosage, is one of the most efficient of all our specific drugs, yet from our experience of 33 years in this country, it has been but one of the factors in the reduction of diphtheria mortality rates. In most cities and states in which data show diphtheria mortality rates prior to 1895, it is found that the trend of the fall of mortality began from 5 to 20 years prior to the introduction of antitoxin and has continued ever since unchanged save by the fluctuations due to chance.

2. Scarlet fever mortality, for which we had no specific therapy, has fallen along a trend practically parallel to that of diphtheria.

3. A study of nearly 800 diphtheria deaths in the states of Indiana and New York reveals that even now, after 33 years of experience with antitoxin, over 40 per cent of our diphtheria deaths occur in cases sick over 3 days before a physician is called; 10 per cent of the deaths occur without receiving any antitoxin at all;

35 per cent are given antitoxin in repeated doses, although this practice has been condemned for years; and in about 35 per cent of deaths antitoxin was not given on the physician's first visit. Any failure on the part of antitoxin to reduce the general diphtheria mortality rates is not due to failure on the part of the drug but rather to our administration of it.

4. Since 1920 there has been a general and marked fall in diphtheria death rates, which is often attributed to the use of toxin-antitoxin. If these data for these states or cities are observed over a long period of time it will be found that in most instances the present fall of mortality rates is well within the range of chance deviation from the general trend line, and is entirely insignificant, due, no doubt, in most cases at least, solely to the operation of chance.

5. Although diphtheria antitoxin has apparently played but a minor rôle in the general reduction in diphtheria mortality rates since 1890, this disease is being controlled and may even be eliminated by the intensive use of diphtheria immunization in the child population. To date the writer knows of only 6 cities where this has been done sufficiently intensively to significantly reduce the diphtheria mortality. There are other cities, no doubt, with similar results which have not come to the writer's notice.

6. In cities where immunization work has been done sufficiently to reduce the mortality rates significantly, it has been accomplished after about one-half of the child population under 15 years of age has been immunized. Unfortunately, detailed information as to the number of children in specific age groups is often lacking. Such data during the next few years would be invaluable.

7. Since about 60 per cent of the deaths from diphtheria occur under 5 years of age, and about 35 per cent between 5 and 10 years of age, or 95 per cent of deaths occur in children under 10 years of age, it is obvious that in an immunization campaign the work should be concentrated upon the children under 10 years of age, and especially upon the preschool children. This last group is the hardest to reach; yet it holds the key position in all immunization work and our efforts will necessarily be relatively unsuccessful as we neglect this group.

NOTE: The writer wishes to thank all the health officers who have so generously furnished the data which have made this study possible.

Childbirth and Fear

IN a certain sense it may truly be said that fear rules the world. At any rate, it enters into most persons' lives in a most disconcerting fashion. And confidence casts out fear—especially confidence based on knowledge, according to Eardley Holland in discussing the midwives of Sweden. In that country midwives are required to have a good education before beginning the study of midwifery, a training which lasts two years. The medical student, in that country, also gets an excellent training in midwifery. The result of it all, according to Holland, is an "atmosphere of confidence" on the part of the public which "has a profound influence in producing easy labor." All normal confinements there are handled by midwives, but in the abnormal cases there is an adequate supply of well-trained obstetricians upon whom to call.

Dr. Holland thinks that England and America might well profit by Sweden's example.—Editorial—*Maternity and Child Welfare*, Aug., 1928.

Heart Disease and School Life

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LIMITATION of an individual's capacity for physical activity is the penalty imposed by heart disease. To understand the cause of this restricted physical ability, it is essential that one have a fundamental knowledge of the physiology of the heart and an appreciation of the changes in its function which result from damage to its structure. Without this intelligent background competent supervision is impossible and the cardiac child is liable to unconscious neglect or over-anxious solicitude.

Normal healthy life is impossible without an adequate circulation of the blood. The flow of blood must be continuous and at the same time distributed in amounts which will vary in accordance with the physiological needs of the different parts of the body. Muscle at rest requires a certain amount of blood, while muscle in action calls for an increased supply which is proportionate to the energy expended.

It is quite obvious that the heart which is the pumping force behind the circulation will have the least amount of work to do when the body is in the condition of complete physical rest. Muscular activity demanding a greater output of blood increases the work of the heart, the maximum expenditure of energy for any individual depending on the ability of his heart to propel the requisite amount of blood. This is true for both normal and diseased hearts.

It is not expected that a man accustomed to heavy work and one of sedentary habits will have the same capacity for physical exertion; but it is expected that every healthy heart will have the power to meet the demands of the ordinary physical activities of daily life. This ability to perform the ordinary activities of life is a standard by which we can estimate the functional capacity of the heart.

In using such a standard one must exclude some extraneous conditions such as acute and chronic infections, anemia, obesity, convalescence and injury or deformity, which may adversely affect the strength of the heart muscle and all the muscles of the body. But other things being equal, individuals of similar physique and habits are expected to show the same reaction to physical exertion.

Inability of the heart to propel enough blood to permit the ordinary

activities without undue discomfort constitutes heart failure. Heart failure does not occur in healthy people. It is a result of heart disease.

Disease may attack the heart in any of its structural elements and destroy the integrity of the mechanism on which the circulation of the blood depends. A damaged heart however may so adjust itself that normal physical activity is possible, or it may be so handicapped that an individual is incapable of performing the ordinary tasks of daily life without discomfort. This handicap will vary in degree. It may be so mild that only slight limitation of activity is imposed, or so severe that no exertion is possible and absolute rest in bed is imperative.

Organic heart disease may be divided into two stages, active and inactive. During the active stage inflammation is actually present in the tissues of the heart. When all evidence of the activity of the infection has disappeared healing takes place by the formation of scar tissue. This is the inactive stage. The progress of the disease has been halted but structural damage remains.

In children the activity of the infection within the heart, more than the mechanical damage to its structure, is the determining factor in heart failure. When the infection becomes inactive children with badly damaged hearts often become capable of carrying on the activities of daily life with little or no discomfort.

The incidence of heart disease among the school children of this country can only be roughly estimated at the present time. Figures are obtainable from only a few localities, and in interpreting these it is necessary to be quite certain that the methods of examination were uniform and the criteria for diagnosis fixed and well observed before it is possible to regard the data with confidence.

Of the 120,000 school children examined in Boston 2,311 were suspected of having heart disease and were referred for special cardiac examination. Of these 625 were found to have organic heart disease. In addition to these there were 160 children of school age but not attending school who had organic heart disease.

The figures for New York were obtained in the routine examination by the physicians of the Department of Health, Bureau of Child Hygiene. On reexamination of some of these children under more favorable conditions and with clothing removed from the chest the figure was reduced to 7 per 1,000. It is rather significant that in 1924, in a routine examination of a large sample (598,167) of children from the elementary schools of the whole of England and Wales, 7 per 1,000 (4,285) were found to have organic heart disease.'

Until such time as the adequate physical examination of children is a routine practice, many cases of heart disease will escape detection

TABLE I

INCIDENCE OF ORGANIC HEART DISEASE IN SCHOOL CHILDREN OF LARGE CITIES

City	Year	Number Examined	Rate per 1,000
Philadelphia ¹	1924	23,671	6.3
Boston ²	1926	119,337	6.6
Chicago ³	1923	158,826	9.0
Chicago ⁴	1924	153,671	15.0
Chicago ⁵	1925	130,266	17.0
New York ⁶	1918	250,000	16.0
New York ⁷	1918-1922	1,336,343	13.9

¹ Board of Education, Department of Public Health, City of Philadelphia, Division of Medical Inspection of Public Schools, 1924

² *Nation's Health*, Dec., 1927

³ *Bull. Chicago Heart Assn.*, Vol. 5, Nos. 1, 2, 3, 4.

⁴ *Bull. Chicago Heart Assn.*, Vol. 5, Nos. 1, 2, 3, 4.

⁵ *Bull. Chicago Heart Assn.*, Vol. 5, Nos. 1, 2, 3, 4.

⁶ Baker, S. J. School Medical Inspection in New York City. *Monthly Bull.*, Department of Health, 1921, XI, 97

⁷ Report of the Committee on Schools of The Association for the Prevention and Relief of Heart Disease, June 14, 1923.

and purely functional disturbances will be wrongly diagnosed as organic heart disease. A satisfactory knowledge of a child's physical defects could be obtained by an examination at the time of admission to school, by reexamination when returning to school after a period of illness, and by a thorough reexamination at regularly fixed periods.

In most localities the medical school officer is not legally permitted to remove the clothing from the chest to make an examination. Under such circumstances a proper diagnosis can be obtained only by referring suspected cases to their private physician or, when they are unable to pay, to a cardiac clinic.

The detection of organic heart disease in a child is only the first step in the problem of its care. Classification of these children according to the degree of limitation of their physical capacity is necessary for intelligent supervision.

For the purpose of defining the different degrees of functional capacity of the heart, the American Heart Association has adopted a non-technical classification which defines the physical ability of the patient as modified by the condition of his heart.

The systematic registration of cardiac pupils in accordance with this classification will permit some definite standardization, will curtail unnecessary absences, will guide in physical exercises and in the supervision of the ordinary exertions incident to the daily school life.

THE CLASSIFICATION

Class I—Patients with organic heart disease able to carry on ordinary physical activity without discomfort

Class II—Patients with organic heart disease unable to carry on ordinary physical activity without discomfort

A—Activity slightly limited

B—Activity greatly limited

Class III—Patients with organic heart disease and with symptoms or signs of heart failure at rest, unable to carry on any physical activity without discomfort

Class E—Possible heart disease. Patients who show abnormal signs and symptoms referable to the heart but in whom the diagnosis of heart disease is uncertain

Class F—Potential heart disease. Patients without heart disease, whom it is advisable to follow because of the presence of a history of an etiological factor which might cause heart disease (in such cases the etiological factor should be stated)

Class I—These children have no symptoms and their physical capabilities are the same as healthy children. Unless reinfection occurs the heart condition is stationary. Accordingly they need but little supervision. They can indulge in the same exercises and pastimes as other children; but by way of precaution it is wise to place some limit on their physical activities. They should not be permitted to engage in competitive athletics or to indulge in games which demand sudden severe physical strain.

Class II A—These children are capable of performing the ordinary activities of childhood, but extraordinary exertions such as fast running, vigorous play, hurrying upstairs produce undue breathlessness and fatigue which are apparent to any attentive observer. Games and exercises which produce only temporary shortness of breath in healthy children are too strenuous for the cardiac children of this class. Running, skipping the rope, prolonged tiring drills should not be permitted. They may enter classes of physical culture but should be compelled to rest during any part of an exercise which unduly tires them.

Class II B—The physical ability of children in this class is noticeably limited. The vast majority have active heart infection as indicated by some degree of fever and a typical white blood cell count. They are sick children and though some of them may be physically able to attend school they should be at rest in bed. It is especially important that children in this class be recognized, because attendance at school is further detrimental to their health. Parents should be informed that these children are unfit for school, that they should be at home and under the care of a physician till all signs of activity of the heart infection have disappeared. After convalescence these children can return to school, being reclassified in Class II A or Class I.

Some children with congenital heart disease have a decided limitation of their physical ability, and occasionally a child with acquired heart disease may have had the heart so severely damaged that his limitation of physical activity is quite marked even in the absence of active infection. Education is merely a passing event with such chil-

dren. All of them will be unfit for any future occupation and their expectancy of life does not reach adult years. These children should not be permitted to climb stairs. If regularly present at school they may be placed in a class with other children who are physically handicapped.

Class III—It is unnecessary to consider the children in this class more than to state that they should not go to school. They are compelled to remain in bed because of the degree of failure of their hearts. Exceptionally, when proper supervision is not maintained, a child in this class may manage to attend school at irregular periods. This is dangerous to the life of the child and should not be permitted.

RECLASSIFICATION

Some children do not remain permanently in the same class. Children in Class I may revert to Class II A, II B or III, or conversely children in the poorer classes may improve and require reclassification on a higher basis. The presence or absence of infection in the heart is usually the cause of change in symptoms which determine the altered classification. The child's school activities should change in accordance with a reclassification.

E—Possible Heart Disease—It is impossible to outline any definite regulations for the physical activities of these children. Limitation may or may not be advisable. The necessary restriction should be determined by the physician of each individual child.

F—Potential Heart Disease—As a cause of heart disease in childhood, rheumatic infection stands preëminent. It has been estimated that as high as 97 per cent of heart disease in childhood is due to rheumatism. It is also claimed that 75 per cent of children who have rheumatism develop organic heart disease. Chorea, or St. Vitus' dance, and growing pains are but different manifestations of rheumatic infection. Some cases of tonsillitis are suspected of being due to the same infection. Scarlet fever is frequently followed by rheumatic symptoms. The actual presence of heart disease which has been caused by these conditions may not be manifested till several months or years later, but during all this period it is essential that the child be under the observation of a physician and that its activities be regulated according to his orders.

REGISTRATION

In a school of 1,500 pupils there would be found probably 10, at the outside 20, children with organic heart disease. From figures available, it can be estimated that 55 per cent of these children are in Class I, 33 per cent in Class II A, 7 per cent in Class II B and 1 per cent in Class III. Translated into numbers: for a school of 1,500 pupils

with a maximum figure of 20 cardiac children one would expect to find 11 children in Class I, about 7 in Class II A, and occasionally a child in Class II B and Class III. This means that the number of children with organic heart disease attending a school of this size would not exceed 18, and probably would be as low as 9 or 10. If to these we add the children who are classified as potential cardiacs, the number will be increased somewhat, but it is still very small when compared with the total school attendance. To supervise properly even this small number of children it is necessary to keep a register. Individual cards for each child, specifying its classification, physical and nutritional defects, can be kept on file, the family or clinic physician being responsible for the data.

GENERAL MEASURES

Aside from heart disease, these children present the same problems in general health as do other children. But in their case it is probably more important that a special effort be made to build up the natural resistance to infection, with the hope of preventing further damage to the heart already diseased.

Measures calculated to attain this end are:

1. Improvement in general nutrition by good food, sufficient sleep, fresh air both day and night, summer vacations in the country
2. Best possible home conditions, eliminating as far as possible the privations of poverty and unhygienic living and sleeping quarters
3. Proper clothing for the different seasons of the year
4. Avoidance of physical strain (unwise parents and guardians may compel cardiac children to perform tasks and household work beyond their capabilities)
5. Institution of those methods which have been found valuable in protection against infectious diseases
6. Correction of physical defects: Eradication of possible foci of infection, especially diseased tonsils and decayed teeth
7. In some districts the provision of transportation to and from school
8. The same protective supervision exercised in school, carried into the hours beyond the school day and into the vacation periods

Such a régime can be instituted and carried out only by the co-operation of the school authorities, the parents, the physician, the nurse, the social worker, welfare agencies and departments of health.

The school nurse or social worker should see that all children with heart disease and those with possible or potential heart disease are under the observation of their own physicians or a cardiac clinic. A visit at least once in three months is desirable, but in some cases it may be necessary to see a physician at shorter intervals.

The actual instruction of a cardiac child should present no more difficulties than are found in the case of the average healthy child. A child with heart disease who is fit to attend school is just as keen

mentally and just as receptive as other children. Attendance at classes is the principal incidental problem. However, "it is not detrimental for children with heart disease to make a perfect score in attendance; for a large number of them do so." Many absences are entirely unnecessary because of a "too ready acquiescence in the child's desire to remain away from school." A careful follow-up in New York showed that "63 per cent of absences were for reasons entirely unconnected with disease of the heart." Holidays, truancy, weather, and family social events accounted for 37 per cent, minor ills for 26 per cent.

It is incumbent on the school authorities to encourage these children to continue their education beyond the elementary grades. Parents should be enlightened on this phase of the problem and informed that "adequate education is more essential for the cardiac child than for the average healthy child, since this opens to him opportunities of employment and amusement which are more likely to conform to his capacity for physical exertion. Most of the work of the uneducated and unskilled is of the laborious nature," and therefore unsuitable for people with heart disease.

In children, physical exertion is not a significant factor in the production of heart failure, while in the adult with heart disease it is probably the most frequent cause of a cardiac breakdown. But inasmuch as these children are being prepared for adult life, their education must be directed along lines which will enable them to engage in occupations which will not require undue physical exertion.

Children who are in a position to continue their education through high school and even through college will be fitted for employment in which the danger of overstrain can be practically eliminated. Those children who for various reasons are unable to pursue the higher courses may enter a trade school and be taught manual work which will prepare them for positions in which technical skill and not physical strength is requisite.

Children with heart disease should know that they are handicapped, but at the same time they should have a true appreciation of this handicap. The school training should make them realize that within their limitations they can lead useful and happy lives.

Exercise and physical exertion which do not overtax the heart, improve the physical fitness of people with heart disease.

Morbid fear of heart disease and distorted sense of its dangers lead to a life of unhappy indolence.

REFERENCE

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The Minimal "Chlorine Death Points" of Bacteria

I. Vegetative Forms

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ALTHOUGH chlorine gas is universally used in the treatment of water supplies, and its derivatives are finding an ever increasing field of usefulness in the disinfection of milk and beverage bottles, dishes, and utensils of various kinds, little is known of the actual or relative amounts of chlorine required to kill specific species of organisms under given conditions. The amount of available chlorine used in practical chlorination has been arrived at empirically or indirectly, and in many instances is probably far in excess of the amount actually needed to destroy the pathogen under consideration. The amount of chlorine required to obtain satisfactory results varies with many factors, and especially with the kind of fluid or material to be sterilized.

Little, if any, work has been done to determine the least amount of chlorine required to kill known numbers of known species of bacteria under fixed conditions that admit of comparison of their relative resistance.

It has not been determined definitely what organism may be considered a safe index of effective chlorine treatment or whether a given organism can be used as an index under different conditions. *B. coli* has been almost universally accepted as the index of safety in the treatment of water supplies. Its acceptance, however, has been based largely on theoretical considerations and on the analogy of its greater resistance to heat and longer survival than the common pathogens which may be present in water.

For these reasons it was considered desirable to study the effect of chlorine on specific bacteria under controlled conditions to determine, if possible, the minimal dosage of free chlorine required to kill specific species of bacteria, to ascertain their relative resistance to free chlorine and, on the basis of these factors, to select, if possible, an organism that could be used as a safe index of effective chlorine disinfection.

In this article the methods used and results obtained with vegetative forms of bacteria are presented.

The methods of preparing the materials for the determinations were as follows:

The chlorine solution used was prepared by adding gaseous chlorine to distilled water until a final concentration of 60 p.p.m. of residual free chlorine was obtained. This served as a stock solution and was stored in a brown bottle in an icebox. At frequent intervals the free chlorine content of the solution was determined, and approximately every two weeks during the experiment a new stock solution was prepared.

The organisms tested included the common intestinal forms, and other pathogenic and non-pathogenic organisms, numbering in all 235 strains.

The intestinal organisms and *B. proteus*, *B. prodigiosus* and *B. pyocyaneus* were grown on agar slants. *Cl. welchii* was grown in glucose broth under anaerobic conditions. The streptococci and pneumococci were grown either in glucose broth or in a special streptococcus broth. The staphylococci were grown in glucose broth and the diphtheria organisms were grown in glucose broth, ascites fluid or serum glucose broth.

The cultures were centrifuged, washed, and resuspended three times in sterile distilled water. They were then diluted in sterile distilled water until a suitable number of organisms per c.c. were present.

The exposures to chlorine were made in sterile distilled water as a menstruum. One hundred and fifty c.c. of distilled water were placed in Pyrex Erlenmeyer flasks, and the contents and flasks were sterilized in an Arnold sterilizer. After the flasks had cooled to room temperature, 50 c.c. of the water in each flask were removed and the chlorine absorbing properties determined. Those flasks containing water showing any appreciable absorption were discarded. The remaining flasks were used for the experiments. The pH value of the water used ranged from 6.4 to 7.2. It is probable that the elimination of the water showing chlorine absorption also eliminated water of low or high pH value.

The tests were carried out by adding approximately 100 to 300 organisms per c.c. to the contents of each of two flasks. From one flask 1 c.c. was planted to determine the number of organisms present. Then a definite amount of free chlorine was added to each of the flasks. One flask was immediately subjected to chemical analysis to determine the amount of residual chlorine present. The other flask was

used for determining the rate of destruction of the organisms and the time required to kill. To do this 1 c.c. of the contents was plated at intervals of 8–10 seconds, 15 seconds, 30 seconds, 45 seconds and 60 seconds. The nutrient agar plates were poured immediately after transferring each 1 c.c. portion from the flasks. These plates were incubated for 48 hours at 37° C. At the end of this time the plates were counted and the rate of destruction and time required to kill the organisms present recorded. It was found that 48-hour incubation was necessary, because in many instances numerous colonies appeared in 48 hours on plates which in 24 hours had no visible colonies. For the organisms that would not grow in plain agar, slight variations of the above procedure were used. With such organisms it was not possible to establish the rate of destruction by chlorine, as no satisfactory means of counting them was available, either before or after the addition of the germicide. It was only possible to determine the length of time required to kill all of the organisms. For this purpose the contents of the flasks were streaked or planted in the type of medium in which the organisms were originally grown. The experiments were carried out at temperatures ranging from room temperature to within a few degrees of the freezing point of water.

RESULTS

The results are shown in Table I. It will be noted that all strains of *B. typhosus*, *B. paratyphosus A*, *B. paratyphosus B*, *B. enteriditis*, *B. dysenteriae*, *B. suipestifer*, *B. proteus*, *B. prodigiosus*, and *B. pyocyaneus* were killed in 15 seconds by a dosage of 0.1 p.p.m. of free chlorine.

Many of the strains of streptococci of both hemolytic and fecal types were also killed by this amount of chlorine, as were all the strains of *Cl. welchii* (vegetative cells) and most of the strains of *C. diphtheriae*. In some instances slightly longer periods of time, i.e., 30 to 45 seconds, were required to kill all the organisms at the concentration of 0.1 p.p.m.

A few strains of pneumococci were slightly more resistant to chlorine than most of the other organisms. Four out of nine strains were killed by 0.1 p.p.m. of chlorine in 15 seconds. The remaining strains were killed by 0.2 p.p.m. of chlorine in less than 1 minute. The strains of *C. diphtheriae* not killed by 0.1 p.p.m. of chlorine were killed by 0.15 p.p.m. in 15 to 30 seconds.

Most of the strains of streptococci not killed by 0.1 p.p.m. of chlorine were killed by 0.15 or 0.20 p.p.m., although three strains were not killed until exposed to 0.25 p.p.m. of chlorine for 15 seconds to 30

TABLE I

DOSAGE OF FREE CHLORINE REQUIRED TO KILL VEGETATIVE CELLS OF BACTERIA IN 15-30 SECONDS

Chlorine p.p.m.	Species	No. of Strains	Species	No. of Strains
0.10	<i>B. typhosum</i>	21	<i>B. pyocyaneus</i>	6
	<i>B. paratyphosum A</i>	6	<i>C. diphtheriae</i>	27
	<i>B. paratyphosum B</i>	6	<i>Achromo bacterium viscosum</i>	3
	<i>B. dysenteriae</i>	8	<i>Strep. scarlatinae</i>	14
	<i>B. enteritidis</i>	4	<i>Strep. fecalis</i>	11
	<i>B. proteus</i>	2	<i>B. suispestifer</i>	8
	<i>Cl. welchii</i>	8	<i>B. prodigiosus</i>	6
	<i>Bruc. melitensis</i>	1	<i>Bruc. abortus</i>	1
	<i>Staph. albus</i>	4	<i>Staph. aureus</i>	4
	<i>Pneumococcus</i>	4	<i>Strep. hemolyticus</i>	11
0.15	<i>C. diphtheriae</i>	12	<i>Strep. morbilli</i>	2
	<i>Strep. scarlatinae</i>	6	<i>Staph. albus</i>	4
	<i>Strep. fecalis</i>	2	<i>Pneumococcus</i>	5
	<i>Staph. aureus</i>	4	<i>B. coli (fecal)</i>	9
	<i>Strep. hemolyticus</i>	10		
0.20	<i>Pneumococcus</i>	4	<i>B. coli</i>	10
0.25	<i>Strep. hemolyticus</i>	3	<i>B. coli (fecal)</i>	9
Total Strains				235

seconds. These latter strains were of the hemolytic variety. Two were isolated from milk and one came from the Boston epidemic of streptococcus sore throat of 1911. It seems probable that the apparently higher resistance of these cocci to chlorine was due to the larger inoculum found necessary to obtain consistent growths. Considerably heavier inoculations of the streptococci were required than in the case of other organisms.

B. coli proved on the whole to be more resistant to free chlorine than the other organisms studied. None of the strains showed any appreciable reduction in number when exposed to 0.1 p.p.m. of chlorine. Nine strains were killed by 0.15 p.p.m. of chlorine, ten strains required 0.2 p.p.m., and nine required exposure for 15 seconds to 0.25 p.p.m. of chlorine for their complete destruction.

SUMMARY AND CONCLUSIONS

From these results it will be seen that a large majority of the vegetative types of organisms considered to be of sanitary importance in connection with water supplies, milk supplies, dish washing, bottle washing, and general disinfection, whether of intestinal or respiratory origin, are killed in a few seconds by rather small doses of free chlorine, when exposed in a suspension containing no organic matter or other substances that react with or absorb the chlorine. This was

found to be true for temperature ranges varying from room temperature to within a few degrees of the freezing point of water.

The amount of chlorine required to kill most of the intestinal pathogens studied under these conditions was 0.1 p.p.m., with the greatest destruction of the organisms occurring within the first 15 seconds of exposure. The same amount of chlorine destroyed most of the pathogenic types of respiratory organisms tested.

In each group, however, there were individual strains which were more resistant to chlorine than the others, requiring more than 0.1 p.p.m. to accomplish their destruction. In the intestinal group of organisms, the most resistant type encountered was *B. coli*. In the group of respiratory origin, three strains of hemolytic streptococci, out of 24 strains tested, required larger quantities of free chlorine for their complete destruction. All the resistant strains of streptococci were killed by 0.25 p.p.m. in 15 to 30 seconds. It is probable that the apparently higher resistance of the streptococcic strains is due to the larger number of organisms used in order to secure consistent growths.

From the standpoint of resistance to chlorine, *B. coli* stands out among the organisms tested as the most suitable for use as an index of the effectiveness of chlorine disinfection. The requisites of such an index organism are: (1) that it be as resistant as, or somewhat more resistant to, free chlorine than the pathogenic organisms which are to be destroyed; (2) that it grow readily on simple media; (3) that it be readily recognizable by simple routine tests. From the standpoint of availability, rapidity of growth, and ready detection, *B. coli* offers superior advantages as an index organism, and it is our feeling that its consistent absence in a menstruum after chlorine disinfection is valuable evidence of the destruction of the pathogens here studied.

On the whole, the experiments appear to furnish a satisfactory theoretical basis for the current practice of relying on the consistent destruction of *B. coli* in water as a criterion of effective chlorination, and that they may also justify a more general application of the same criterion to other type phases of chlorine disinfection now being developed, such as the washing of milk bottles and equipment and the washing of dishes and eating utensils.

A Sickness Survey of Winchester, Mass.*

Part II: Communicable Disease

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A DESCRIPTION of the manner in which the survey was conducted, together with a short review of the demography of Winchester, was included in Part I.¹ Individuals under 20 years of age were questioned as to whether they had ever had any of the following diseases: measles, whooping cough, chicken pox, mumps, scarlet fever, German measles and diphtheria. They were also questioned as to the age and year when they had the disease, whether a doctor was employed, and whether they had had a second attack of the same disease.

Through the courtesy of S. J. Crumbine, M.D., of the American Child Health Association, unpublished data in connection with a similar survey in Gardner, Mass., covering the diseases scarlet fever, diphtheria and measles, are included in this report. Available data from other similar studies^{2, 3, 4, 5} are included for comparison with those of Winchester and Gardner.

The number of persons (under 20 years of age) surveyed in Winchester was 3,365; in Gardner, 3,305; in Collins's report, 31,353; in London, 8,786; in Shelburne-Buckland, 394; in Brazil about 500, and in Baltimore about 5,000.

From the collected data, the percentage of individuals at different ages who suffered an attack of the specified diseases at some time during their lifetime was computed and compared with similar percentages from the other studies cited.

In Winchester approximately 80 per cent of the population under 20 years of age was surveyed; in Gardner the percentage was about 45. We feel that in both Winchester and Gardner a random sample of the age distribution of the population under 20 was approximated.

If the percentages from the different studies are plotted and smoothed, the shapes of the resulting curves vary. The curves for the

* The first of the series of studies, *Part I: General Morbidity*, by Herbert L. Lombard, M.D., M.P.H., was published in the September, 1928, issue of the AMERICAN JOURNAL OF PUBLIC HEALTH AND THE NATION'S HEALTH. Parts II and III are somewhat shortened. Reprints including full detailed material may be obtained from the authors.

seven diseases fall roughly into two groups. The one group including chicken pox, measles and whooping cough shows a sharp rise in the percentage of those attacked from 0 to about 10 years of age. The other group including diphtheria, scarlet fever and German measles shows a gradual increase in the percentages from 0 to about 20 years of age. The curve of mumps falls between the curves of the two groups mentioned, but more nearly approaches the curve of the first group.

These facts coincide with what is generally known in regard to the higher rate of infectivity in diseases like chicken pox and measles, as compared with a lower rate of infectivity for diphtheria and scarlet fever, based on clinical evidence.

The curve of any of these diseases would be affected by a falling incidence of the specific disease, whatever its cause. This applies in particular to diphtheria in Gardner, where there was a definite outbreak in 1917 with a decline since, and no cases reported in the last 2 years.

Chicken Pox—Slightly more than 50 per cent of the people have had chicken pox by the time they reach their 20th birthday. This disease is somewhat like measles. It attacks the population quickly and reaches its saturation point at about age 10.

Measles—By the time individuals reach the age of 20, roughly 90 per cent have had measles. There is some evidence that above the age of 10 both the individual questioned and his parents have forgotten whether the child concerned has had the disease. This is true in Gardner where the percentages decrease slightly but constantly from age 10 to 20. Although in Gardner the figures show that about 90 per cent of the population surveyed had the disease by their 10th birthday, for the total populations included in the study this is true of approximately 80 per cent.

Whooping Cough—By the time individuals reach age 20, from 60 to 75 per cent have had this disease. The percentage for Baltimore (43) is low for some reason.

Mumps—The incidence of this disease, except in Baltimore where the percentage is unusually low (24), varies from about 40 to 60 per cent at age 20.

Diphtheria—Making a rough allowance for variation due to small numbers, the percentages at age 20 in the studies cited vary from 3 to about 15. In Massachusetts, unpublished figures show that the morbidity and mortality from this disease vary with the size of the community, while in Shelburne, Winchester and Gardner a somewhat similar variation occurs. Shelburne, the smallest, is distinctly a rural

community. Although the population density of Winchester, the next larger, is somewhat higher than that of Gardner, the largest, Winchester is much more distinctly a residential community than is Gardner.

Scarlet Fever—Individuals who have had this disease by the time they reach the age of 20 vary in their percentages from 2 to 31.

German Measles—The incidence of this disease varies from 12 to about 23 per cent in the populations studied.

From the London, Winchester and Gardner figures at age 10 these percentages for the specified diseases are estimated as follows: chicken pox, 50; measles, 80; whooping cough, 65; mumps, 45; diphtheria, 5; scarlet fever, 10; German measles, 10. Of the two sets of percentages offered, we are inclined to believe that the percentages given at age 10 are more reliable than at age 20.

Secondary Cases—Table I shows the percentage of persons who had two independent attacks of the same disease. We are not satisfied that they are an accurate estimate of recurrent attacks.

TABLE I
PERCENTAGE OF INDIVIDUALS HAVING HAD ONE ATTACK OF SPECIFIED
DISEASE WHO HAD A SUBSEQUENT ATTACK

Disease	Winchester Per Cent	Gardner Per Cent
Measles	1.9	1.3
German Measles	2.4	—
Chicken Pox	0.3	—
Whooping Cough	0.4	—
Mumps	0.1	—
Diphtheria	1.1	0.6
Scarlet Fever	0.0	2.5

Number Employing Physicians—Table II shows the percentage of cases in which a physician was employed. The percentages were higher in Winchester than in Hagerstown or Gardner for most of the diseases, and may be due to a better economic status of the population

TABLE II
NUMBER EMPLOYING A DOCTOR

Disease	HAGERSTOWN		WINCHESTER		GARDNER	
	Cases	Per Cent of Total Having Disease	Cases	Per Cent of Total Having Disease	Cases	Per Cent of Total Having Disease
Measles	364	64.1	1518	76.8	1253	55.1
Diphtheria	44	97.8	90	91.0	151	96.2
Scarlet Fever	33	97.1	247	91.5	248	87.4
Whooping Cough	183	48.8	1319	74.4	*	*
Chicken Pox	105	45.2	1127	78.2	*	*
Mumps	3	33.3	666	74.8	*	*
German Measles	7	38.9	191	77.6	*	*

* Information not available.

in Winchester. A study of cases where practitioners other than physicians were employed in Winchester showed 4 per cent in scarlet fever, 2 per cent in diphtheria, 1 per cent in whooping cough, about 1 per cent in measles and 1 per cent in chicken pox.

Reporting of Diseases—Table III shows the percentage of reported cases for the three diseases in Gardner, for seven diseases in Shelburne and Winchester and for five in Hagerstown. The Gardner figures as well as the Winchester figures were obtained by taking the ratio or reported cases to the estimated number of cases based upon those found in the survey. It is worth noting that the figures show that with few exceptions scarlet fever and diphtheria are better reported than the other diseases.

Of all the percentages quoted, we are inclined to feel that the Hagerstown estimates are the most reliable.

TABLE III
PER CENT OF CASES REPORTED

	Diphtheria	Measles	Scarlet Fever	Chicken Pox	German Measles	Mumps	Whooping Cough
Gardner *	68.9	19.6	69.8	—	—	—	—
Winchester †	119.6	48.6	93.6	48.4	112.9	53.1	20.7
Shelburne †	180.0	33.3	88.1	3.5	19.4	4.0	.8
Hagerstown ‡	88.7	40.3	102.0	34.4	—	—	30.5

* 1919-1926.

† 1917-1926.

‡ Dec. 1, 1921-Mar. 31, 1924.

SUMMARY

1. The seven diseases fall roughly into two groups. One group includes chicken pox, measles, and whooping cough, which shows a sharp rise in the percentages of those attacked from 0 to about age 10. The other group includes diphtheria, scarlet fever, and German measles, which shows a gradual increase in the percentages attacked from 0 to about age 20. The rise in the percentages of those attacked by mumps is more nearly like that in the first group.

2. At age 20, from the London, Winchester and Gardner figures, the percentage of individuals who had had the following diseases was roughly: chicken pox, 55; measles, 90; whooping cough, 70; mumps, 50; diphtheria, 15; scarlet fever, 20; German measles, 15.

3. At age 10 these percentages for the specified diseases were estimated as follows: chicken pox, 50; measles, 80; whooping cough, 65; mumps, 45; diphtheria, 5; scarlet fever, 10; German measles, 10.

4. Doctors attended in Hagerstown, Winchester, and Gardner from 87 to 98 per cent of the cases of diphtheria and scarlet fever and from 55 to 77 per cent of the cases of measles. In Winchester they

attended about 75 per cent of all the others of the seven diseases, and in Hagerstown from 33 to 49 per cent.

5. Scarlet fever and diphtheria are generally better reported than the other diseases.

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Part III: Physical Defects of School Children

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WINCHESTER, through an interested school committee and an unusually well-informed superintendent, was one of the first towns in the state to initiate a broad school health program. The school physician, whose standards are excellent, gives a "stripped to the waist" examination to every child from kindergarten through high school; he devotes an average of 2 hours a day to school work. A woman physician examines the junior high and high school girls. A nurse is employed full time in the schools. Health education is carried on by the teaching staff. Of the 8 school buildings, 5 have been built within the last few years.

Physical examinations of all the children were made in the fall by the school physician. In June before school closed the physician making the survey checked every child to note the defects which had been corrected during the winter. All the necessary records in this connection were collected, coded and studied. Fifteen hundred and thirty-five children were studied. Those whose defects were corrected were not counted as defective in the tables on absence.

A record of absences with duration and cause, for all children from kindergarten through junior high school, was kept through the school year 1926-1927 by the teachers.

DISCUSSION OF RESULTS

Defects and Sex—No association was found between sex and defects or between sex and the frequency of defects. Two hundred and eighty-one, or 36 per cent of 772 boys examined, had no defects noted;

283, or 37 per cent of 763 girls examined, had no defects noted; 38 per cent of both boys and girls had more than one defect.

Defects and Economic Standing—The children from the less privileged group, namely, the Noonan and Lincoln schools, showed a greater percentage of every defect than those from the more privileged, or the Mystic and Wyman schools. Figures from two schools having mixed groups were not included. In the schools included, the racial groups were practically pure. The number of corrections was proportionately greater in the Mystic and Wyman than in the Noonan and Lincoln schools. Out of a total of 834 defects in the first-named schools, 423 (51 per cent) were corrected. In the other schools out of 1,203 defects, 270 (22 per cent) were corrected.

TABLE I

PER CENT OF THOSE EXAMINED WHO SHOWED DEFECT, BY SCHOOLS

	Privileged Group			Less Privileged Group		
	Mystic Per Cent	Wyman Per Cent	Total Per Cent	Noonan Per Cent	Lincoln Per Cent	Total Per Cent
Nutrition	5	11	8	7	13	10
Posture	22	11	15	25	19	22
Tonsils	12	8	9	30	27	28
Adenoids	12	8	10	30	27	28
Teeth	12	9	10	47	49	48
Heart	9	6	7	10	15	12½
Eyes	32	18	24	38	35	36½

The Lincoln School showed a significantly larger number of defective teeth, tonsils, adenoids, and hearts; the Noonan a significantly larger number of defective teeth, tonsils and adenoids.

Correlation of Defects—The figures showed a positive correlation between defects of teeth and eyes, teeth and posture, teeth and tonsils, and teeth and adenoids, posture and nutrition, tonsils and adenoids, and tonsils and heart. This indicates that if a child has one defect he is likely to have other defects, and that there probably exists some fundamental condition underlying all his defects. The correction of the defects removes the inconvenience caused by the defect, but may probably have no effect upon the underlying conditions causing the defects.

TABLE II

NUMBER HAVING CERTAIN COMBINATIONS OF DEFECTS

	Eyes	Posture	Tonsils	Adenoids	Nutrition	Heart
Teeth	127 (100*)	116 (84)	122 (68)	117 (68)	57 (48)	50 (36)
Eyes		86 (81)	81 (65)	77 (65)	43 (46)	33 (35)
Posture			66 (55)	67 (55)	123 (39)	36 (29)
Tonsils				244 (44)	32 (31)	38 (23)
Adenoids					28 (31)	36 (24)
Nutrition						20 (17)

* Number expected according to the theory of independence.

Defects and Grade—Defects of nutrition and posture tended to develop with advancement in grade while defects of teeth and eyes were corrected. In the first grade the percentage of defective eyes was more than twice that found in the 7th and 8th grades and the percentage of defective teeth almost three times that in the 7th and 8th grades. The eye test was that given by teachers using the E chart, and was therefore very crude. The same test, however, was used for all children, and therefore the possibility of error was the same for all.

TABLE III

PER CENT OF THOSE EXAMINED WHO SHOWED DEFECTS IN GRADE

Defect	1st Grade Per Cent	2d-6th Grade Per Cent	7th-8th Grade Per Cent
Nutrition	5	11	23
Posture	18	19	33
Teeth	41	34	14
Tonsils	22	18	14
Heart	8	9	12
Eyes	51	26	25

Defects and Retardation—The first grade was the one most frequently repeated. The repeaters showed a higher percentage of defects than the non-repeaters, the percentage of repeaters showing defects of posture and teeth being significantly greater.

TABLE IV

PER CENT REPEATING EACH GRADE

No. of Children in Grade	Grade	Per Cent Repeating
1361	1st	10
1182	2d	5
1002	3d	5
805	4th	5
628	5th	7
473	6th	4
308	7th	1
148	8th	3

TABLE V

PER CENT OF THOSE FOUND TO HAVE DEFECTS AMONG REPEATERS' AND OTHERS

Defect	Repeaters Per Cent	Others Per Cent
Nutrition	15	12
Posture	31	19
Teeth	37	23
Tonsils	22	17
Heart	12	9
Eyes	31	29

Further study only will show whether the conclusions based on these figures are sound. So many other factors also enter into retardation that careful investigation is necessary to determine the

relative importance of each. This is particularly true in the 1st grade where children are entering a new environment and are obliged to adapt themselves to hitherto unknown conditions. The mental defectives are weeded out from grade to grade, which naturally lessens the number of retarded children in the upper grades. Language difficulties may be a cause of retardation.

Other interesting questions are raised by the study. Is there a real correlation between posture and retardation? Does the attitude of mind causing the failure also cause the poor posture or does the physical condition underly the failure? Are the findings in Table VI of sufficient importance to warrant further study?

TABLE VI

ALL CHILDREN IN PRIMARY OR ELEMENTARY GRADES WHO HAVE REPEATED
OR ARE TO REPEAT 1ST GRADE

Three Schools—(Not Giving I. Q.)

CAUSES OF RETARDATION AS GIVEN BY TEACHERS

1. No cause—immaturity—"backwardness"	52
(Of these 23 were Italians)	
2. Sickness	13
3. Needed glasses	2
4. Frequent absence	3
5. Deficiency in reading	6
6. Other reasons	8
<hr/>	
Total repeating 1st grade	84

Two Schools—(Keeping I. Q. as Obtained in Group Tests)

CAUSES OF RETARDATION AS GIVEN BY TEACHERS

1. No cause—"backwardness"	24
I. Q. not given	5
I. Q. from 76-87	7
I. Q. from 90-100	5
I. Q. from 100-117	7
2. Sickness	4
3. Frequent absence	1
4. Needed glasses	1
5. Other reasons	2
<hr/>	
Total repeating 1st grade	32

Defects and Absence—The figures did not show that defects of nutrition, teeth, tonsils, heart, or eyes were more common among children who were absent from school. This included absence from any cause.

The median number of days absent of those with normal nutrition was 7.0, with defects of nutrition 5.6; with normal teeth 7.3, with defective teeth 5.4; with normal tonsils 6.8, with defective tonsils 6.2; with normal heart 6.9, with defects of heart 5.6; with normal eyes 5.7, with defective eyes 7.2..

TABLE VII
TOTAL ABSENCE

Cause of absence	Days Absence
Colds *	6,415
Other communicable diseases	1,816
Diseases of digestive tract	503
Sickness other than above or kind not stated	2,584
Absence due to causes other than sickness	2,850
Total days of absence	14,168

* The term "cold" as used here is used in the ordinary meaning of the term among lay people.

CONCLUSIONS

1. There was no association between sex and defects or the frequency of defects.
2. Children in the less privileged group showed a greater number of defects with fewer corrections than those from the more privileged group.
3. Defects of nutrition and posture increased with advancement in grade, while defects of eyes and teeth were corrected.
4. The figures showed a correlation between defects of posture and teeth and retardation. But the study does not bring out all the factors.
5. The figures did not show any correlation between defects and absence from school for any cause.
6. These findings were obtained in a town with a mixed population where environmental conditions are excellent and where there is a good school health program.

Relief to the Hurricane Districts

A REPORT of the Red Cross relief operations in districts recently affected by the West Indies hurricane shows that the organization has been active in Florida, Porto Rico and the Virgin Islands. Relief was hurried to the stricken area immediately and a minimum fund for care of the suffering was estimated at \$5,000,000. In about a week an amount totaling \$1,369,000 was raised by state chapters throughout the country, except in South Dakota and Nebraska, where a fund campaign is being carried on to take care of the sufferers of recent tornadoes in those states.

It was estimated that 15,000 families were made homeless in the entire area, but this report probably did not completely cover the Lake Okeechobee region. Food, clothing, camp and tent equipment were hastened to the stricken areas.

The Florida State Board of Health is in charge of all sanitary activities, and reports that rather favorable conditions prevail along the eastern coast. West Palm Beach reports a good water supply and is shipping water to points outside the city. All milk is being distributed from Miami. On the other hand the sanitary conditions around Lake Okeechobee have been serious due to the unburied bodies of people and animals and the continued flooded condition of the land. The State Board of Health was assisted by the Red Cross and the National Guard in disposing of the dead and cleaning up the flooded regions. Public health nurses from various districts of Florida and Georgia assisted the contingent of Red Cross nurses detailed to the relief work. Typhoid serum has been offered to the Florida State Board of Health and to the Red Cross. In the Virgin Islands the sanitary situation is well in hand, but in Porto Rico the situation is more serious.

Vision Survey Among a Group of Pupils of Syracuse Schools

HARRY H. LEVY, M.D.

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THE care of the vision of the school children is a responsibility that must be assumed by school authorities as well as by the parents. Many times the fact that a child has poor vision is not discovered until he enters school.

The age at which the vision of school children should be tested, and the methods which should be used, have been matters of considerable discussion. Whether the school physician in his routine examination is able to find the cases of eye defects requiring the attention of an oculist has also been questioned. In our effort to determine these points and to make studies of other factors bearing on visual comfort, a staff was specially formed and equipped to make a study in Syracuse schools. Schools were chosen in which there were children of varied nationalities and economic home conditions.

The study was conducted under the direction of the author, with the assistance of one physician full-time and one part-time. The nurse located in the school in which the work was being done also assisted. A clerk recorded findings. The study was begun October 15, 1926, and completed May 31, 1927.

A Snellen test card at a distance of 20 feet was used. This was illuminated by direct light greater than 10 foot-candle power. This test was later supplemented by a Snellen test card mounted on a board, to the upper edge of which was attached an electric fixture similar to that used on desk lamps. A 50 candle power frosted bulb threw the desired amount of illumination down upon the chart. This apparatus, which proved most satisfactory, was designed in the Department of Health Supervision of School Children, and was assembled in the vocational department of one of the schools.

In addition to the Snellen test card an Ives acuity apparatus* was used. The illumination is a part of the apparatus and therefore of constant intensity. This apparatus measures vision numerically in tenths, with "one" equivalent to normal, or approximately 20/20 on the Snellen test card. However, after examining 1,499 pupils with

* Loaned by the Bausch & Lomb Optical Company, Rochester, N. Y.

the Ives acuity apparatus and finding that the results obtained corresponded very closely with the results obtained from the use of the Snellen test card, the use of the Ives acuity apparatus was discontinued as unsatisfactory for school work for the following reasons:

1. The test is entirely subjective. For this reason it is necessary to depend upon the reply of the pupil in taking the vision. In the second year coöperation was unsatisfactory in some cases and below the second year coöperation could not be expected.

2. The instrument is so large it is not easily transported.

3. The instrument is very expensive and therefore could not be a part of the equipment of each school.

The Snellen test card, mounted on a board and illuminated with a 50 candle power bulb, is much more satisfactory than the Ives acuity apparatus for use in the schools for the following reasons:

1. The Snellen test card is objective and what the pupil can read is visible to the examiner.

2. The Snellen test card has the advantage of being interchangeable for use in examining pupils who do not know the letters. In this instance the illiterate E chart has proved very useful, especially in the kindergarten grades.

The vision of each eye of the pupil was determined in the examination. Where the pupil was wearing glasses the vision was taken with and without glasses. The test was made first with the Snellen test card. In the first 1,499 pupils examined, the Ives acuity apparatus was used in addition to the test with the Snellen test card.

Following the vision test the lids were everted and inspected, pupillary reflexes tested to light, the cornea examined, muscle balance tested as to relationship of the two eyes, and an examination of the interior or fundus of the eyeball was made. Through this examination it was learned whether it was some pathological condition or abnormality of the eyeball itself which interfered with vision or whether the difficulty was due to refractive error, such as far-sightedness, near-sightedness, astigmatism or a combination of any of these.

A history chart, filled in by the pupil examined, presented a record of symptoms and a history of previous diseases, or conditions that might affect vision. The record furnished by this chart and the result of the vision test were correlated in determining the further treatment of each case.

The standard of poor vision will be understood to be a vision of 20/40 or less. Pupils with a vision of 20/40 or less, and pupils with a vision of 20/30 or better who presented symptoms of asthenopia, were referred for further investigation. Since we find cases where an individual has a vision of 20/30 and in which there is found a refractive error of small degree which would not account for the vision being less than 20/20, we designated 20/30 as the upper limit of normal. A

TABLE I

PUPILS WHOSE VISUAL ACUITY WAS DETERMINED AND NUMBER REFERRED FOR REFRACTION

School	Nationality	Economic Conditions	Number Enrolled	Pupils Examined	Pupils with Poor Vision	Percentage with Poor Vision	Pupils with Asthenopia	Percentage with Asthenopia	Total Number Referred for Refraction	Percentage Referred for Refraction
Brighton	American	Good	458	432	44	10.2	37	8.5	81	18.7
James Street	American (mixed)	Good	823	767	64	8.3	51	6.6	115	15.0
Jefferson	Italian	Fair	474	391	53	13.5	9	2.3	62	15.8
Lincoln	American	Very Good	990	944	68	7.2	61	6.4	129	13.6
Seymour	American (mixed)	Poor	931	874	112	12.8	83	9.5	195	22.3
Sumner	American	Good	640	613	41	6.6	32	5.2	73	11.9
			4,316	4,021	382	9.5	273	6.7	655	16.3

pupil with vision of 20/30 and with no symptoms was not routed for refraction. The cases which were routed for refraction and further examination were given the card used in the schools advising parents to consult the family physician or an oculist.

Of the 4,060 pupils examined 3,910 were cases of hyperopia; 142 were cases of myopia, and 8 were cases of mixed astigmatism which is a type of myopia. Among the 4,060 pupils examined 63, or 1.5 per cent, were afflicted with strabismus or cross-eyes. Of these 63 cases, 26 were referred for refraction, 3 of whom were already wearing glasses.

Of the total number of 4,060 pupils examined, the visual acuity of 39 could not be determined because of lack of coöperation. Among the 4,021 pupils were 11 who had poor vision because of disease to some part of the eyeball and 1 pupil who had lost an eye. There were 10 cases of defective color vision. It is possible that if these cases had been further investigated, it might have been found due to color ignorance rather than to color blindness.

Since poor vision alone is not the only reason for the need of re-

TABLE II

NUMBER REFERRED FOR REFRACTION—BY SCHOOL AND SEX

School	Pupils Examined	Boys Examined	Boys Referred for Re- fraction	Percentage Boys Re- ferred for Refraction	Girls Examined	Girls Referred for Re- fraction	Percentage Girls Re- ferred for Refraction
Brighton	432	215	33	15.3	217	48	22.1
James Street	767	394	54	13.7	373	61	16.3
Jefferson	391	202	26	12.8	189	36	19.0
Lincoln	944	492	71	14.4	452	58	12.8
Seymour	874	464	92	19.8	410	103	25.1
Sumner	613	335	41	12.2	278	32	11.5
	<hr/> 4,021	<hr/> 2,102	<hr/> 317	<hr/> 15.0	<hr/> 1,919	<hr/> 338	<hr/> 17.6

fraction and the use of glasses, a search was made for symptoms of weak vision or asthenopia brought on by unusual use of the eyes, even where the vision may have been normal. Table I shows, by schools, the number of pupils whose visual acuity was determined and the number referred for refraction and Table II shows, by school and sex, the number referred for refraction. These figures indicate that the percentage of girls referred for refraction is slightly greater than that of boys, 17.6 as compared with 15 per cent. Table III shows the number at the various ages referred for refraction. These figures, as would be expected, show in the older age groups a gradually increasing percentage of children in need of refraction. Table IV shows the number referred for refraction in the various grades.

To aid in determining whether scholarship is affected by vision, a chart termed "psychological chart" was made by the teacher for each pupil. This chart gave the number of failures, if any; the scholarship rating; the intelligence or mental ability; industry or desire of the pupil to work; and the intelligence quotient of the pupil.

Scholastic records were available in the cases of 3,894 pupils. Of this number, 1,207, or 31 per cent, failed at least once. There were 2,207 pupil failures, or an average of 1.8 failures per pupil who failed. There were 2,035 boys, of whom 713, or 35 per cent, failed; and 1,859 girls, of whom 494, or 26.6 per cent, had failed at least once.

In reviewing the records of failures in the schools and the number of failures per pupil who failed, we find the highest rate occurring in the Jefferson School, where the parents of the pupils are mostly foreigners and the economic conditions are only fair. Under these circumstances there is usually little opportunity for assistance at home.

TABLE III
NUMBER REFERRED FOR REFRACTION—BY AGE

	Total	5	6	7	8	9	10	11	12	13	14	15	16	17
Number examined	4021	181	362	479	427	493	484	529	408	314	241	79	21	3
Number referred for refraction	655	14	26	60	71	74	81	104	76	72	54	20	3	-
Percentage	16.3	7.74	7.18	12.5	16.6	15.0	16.7	19.6	18.6	22.9	22.4	25.3	14.3	-

TABLE IV
NUMBER REFERRED FOR REFRACTION—BY GRADES

	Total	Kgn.	1st	2d	3d	4th	5th	6th	7th	8th	9th	Deaf	Ung.*
Number examined	4021	122	512	536	510	548	524	481	309	273	143	10	53
Number referred for refraction	655	8	36	83	97	81	95	99	72	51	15	3	15
Percentage	16.3	6.56	7.0	15.5	19.0	14.8	18.1	20.6	23.3	18.7	10.5	30.0	28.3

* Ungraded classes

TABLE V

PERCENTAGE OF REGISTRATION WITH ONE OR MORE FAILURES—BY GRADES

Percentage of Failures	Ung.	Kgn.	Grade									Total
			1st	2d	3d	4th	5th	6th	7th	8th	9th	
Boys with normal vision	90.5	—	16.1	32.8	36.9	26.	44.8	43.2	37.4	35.3	39.3	34.3
Boys with defective vision	63.6	—	18.2	24.4	50.	35.	54.3	42.	40.	43.5	37.5	39.2
Girls with normal vision	78.5	—	15.4	20.8	27.	27.6	28.1	29.5	34.6	28.7	29.8	25.
Girls with defective vision	57.1	—	7.1	30.9	40.4	36.6	32.7	35.7	30.7	40.7	20.	34.2
Total Registration	77.7	—	15.66	27.6	34.3	34.	37.35	37.5	35.6	34.	34.3	31.

Of the 655 pupils referred for refraction (see Table III), scholarship ratings were available in 638 cases. These are shown in Table VI.

TABLE VI

SCHOLARSHIP RATING AMONG PUPILS WITH DEFECTIVE VISION

		Rating		Rating	
		Poor or Fair		Good or Excellent	
Number Recorded		Number	Per Cent	Number	Per Cent
Total	638	289	45.3	349	54.7
Boys	307	144	46.9	163	53.1
Girls	331	145	43.8	186	56.2

It would appear from the figures and from observations, that the greatest factor influencing scholarship among pupils is the intelligence of the pupil and his desire to work, rather than the fact that he has poor vision. The records indicate that if the pupil is willing and anxious to learn and has the ability to retain knowledge, even though his vision may be poor, his scholarship is of the average or better.

By means of the foot-candle meter the amount of illumination in the schoolrooms was measured, and with the exception of one school it was found to be of sufficient degree to meet the standard requirements of 5 foot-candles. However, we do not believe this is sufficient to provide proper illumination for the pupils seated farthest from the windows even on bright days. In the newer schools it was found that the proportion of window space to the size of the rooms and the placing of the seats to avoid shadows were excellent. Despite this, however, on dark days when artificial light was required, illumination in the rooms was poor. It was impossible to learn the conditions under which the pupil must work in preparing his lessons at home.

An examination of the books in the classrooms showed that with few exceptions glazed paper was used. There is no paper so troublesome to vision and visual effort. In many cases the print was entirely too small and very little attention had been given to spacing.

Another source of great annoyance was the reflection from polished desk surfaces. It would seem that the comfort of the pupil would be increased and visual effort decreased if desk surfaces were finished dull.

FIGURE I—PERCENTAGE OF PUPILS EXAMINED REFERRED FOR REFRACTION—BY AGES



It would also aid in decreasing visual effort if the blackboards were given a dull finish. It is suggested that, until blackboards are finished with a dull surface, soft chalk be used.

SUMMARY

Of the 4,021 pupils whose visual acuity was determined, 1,499 were tested with both the Snellen test card and the Ives visual acuity apparatus. The results corresponded most favorably and justified the continued use of the Snellen test card because of its adaptability to all conditions, and the discontinuance of the Ives visual acuity apparatus because of the inconvenience involved.

Of the 4,021 pupils whose visual acuity was determined, 382, or 9.5 per cent, were referred for refraction because of poor vision and 273, or 6.7 per cent, because of asthenopia. A total of 655, or 16.3 per cent, were referred for refraction.

FIGURE II—PERCENTAGE OF REGISTRATION REFERRED FOR REFRACTION—BY GRADES

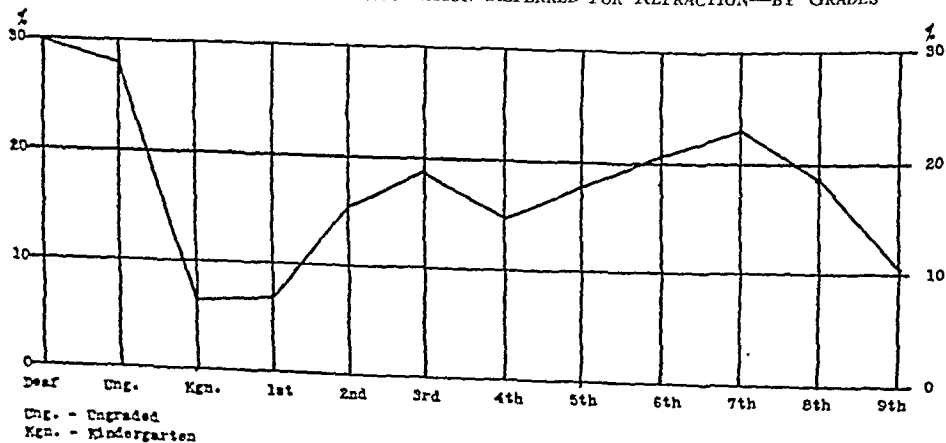
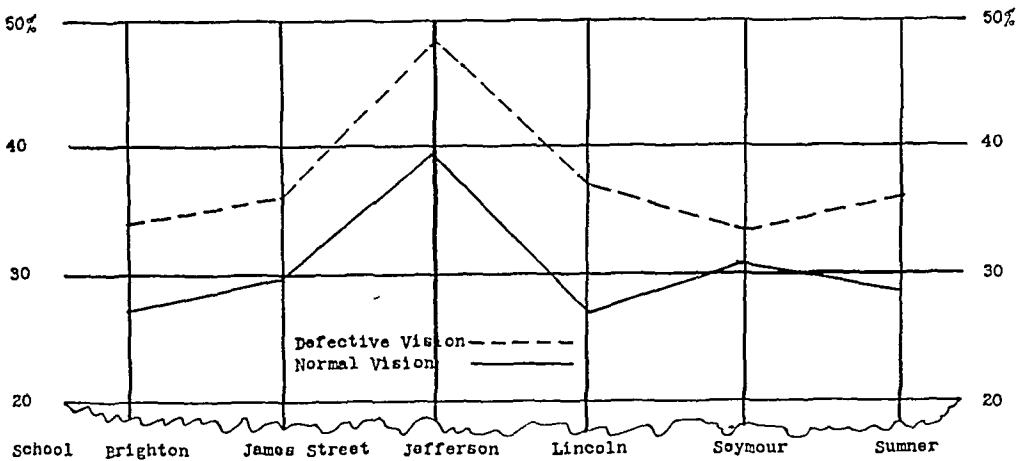


FIGURE III—PERCENTAGE OF FAILURES AMONG PUPILS WITH NORMAL VISION AND DEFECTIVE VISION—BY SCHOOLS



There is a steadily increasing number with defective vision from the early years with a condition of progressive myopia.

The general consensus of opinion has been that scholarship is affected by poor vision. The higher percentage of failures among pupils with poor vision would bear out this belief (Figure III). The fact that the higher percentage of failures occurs among pupils of both sexes with poor vision would tend to strengthen this assumption (Figure IV).

However, a further study of the relationship between failures and defective vision shows the higher percentage of failures to have occurred among the boys of whom there were but 15 per cent referred for refraction as compared with 17.6 among the girls (Figure V).

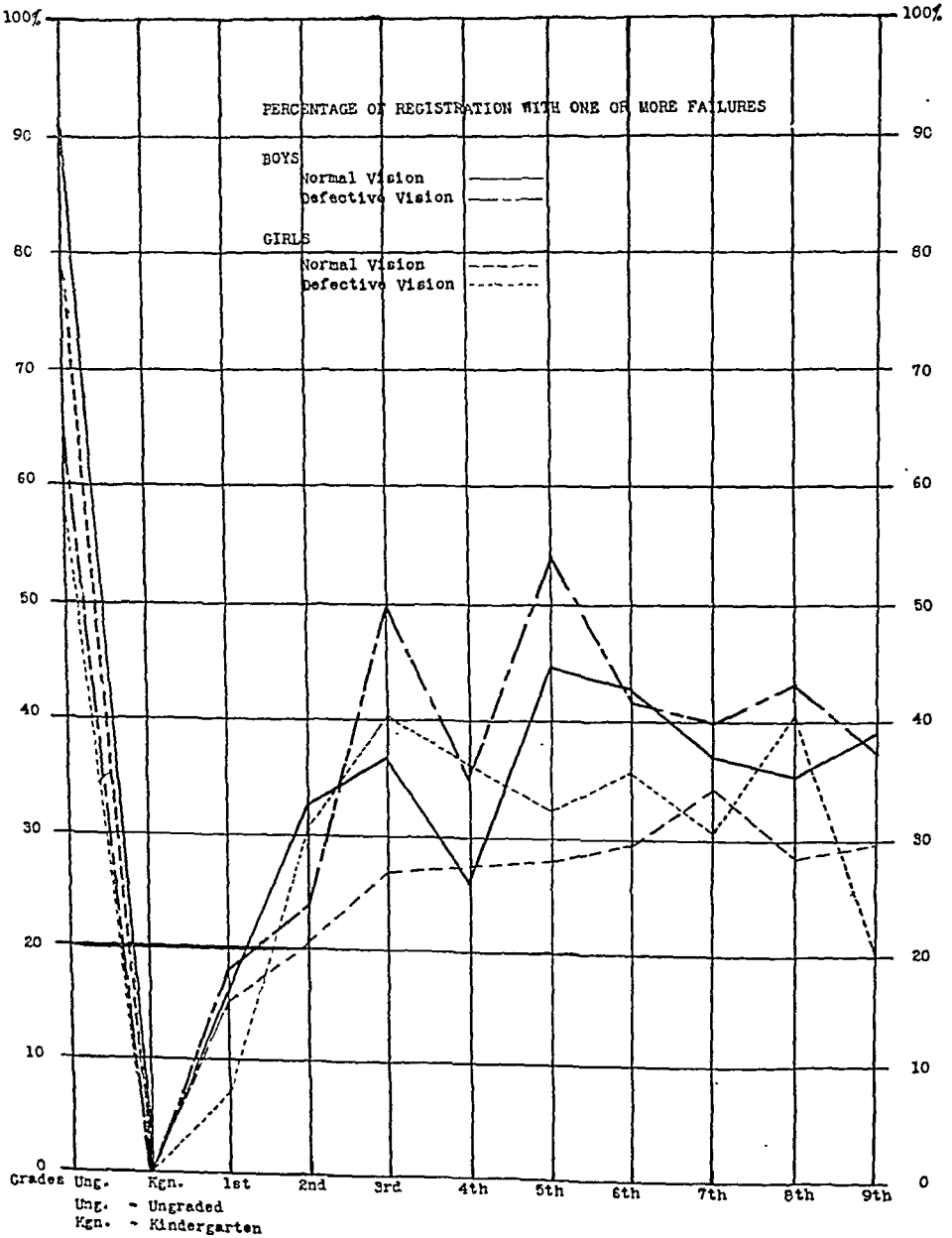
The highest percentage of pupils of both sexes was referred for refraction at Seymour School (Figure VI). The highest percentage of failures among both sexes occurred in Jefferson School where the nationality is Italian and the home conditions are poor.

Among the pupils referred for refraction the higher percentage occurred among those with good or excellent scholarship.

We believe the charts shown present a comparable study of the relationship between defective vision and scholarship and justify our conclusions that other factors influence scholarship as much or more than poor vision and asthenopia, and that poor scholarship is due more to lack of mental ability than to poor vision or asthenopia.

As a result of our study of the relationship of light to the comfort of the school child, it was found that even in the most modern schools conditions are still far from perfect. Bright days are the exception rather than the general rule in Syracuse and we believe that additional indirect lighting should be added to the direct lighting of the rooms.

FIGURE IV



The study cannot be considered complete until the results of our examinations are checked a year later. At that time the pupils who were referred for refraction will have had the benefit of the examination and correction. It will also be an opportunity to learn just how many cases have improved in scholarship and industry as a result of this correction.

FIGURE V—PERCENTAGE OF FAILURES AMONG PUPILS REFERRED FOR REFRACTION BY SEX AND SCHOOL

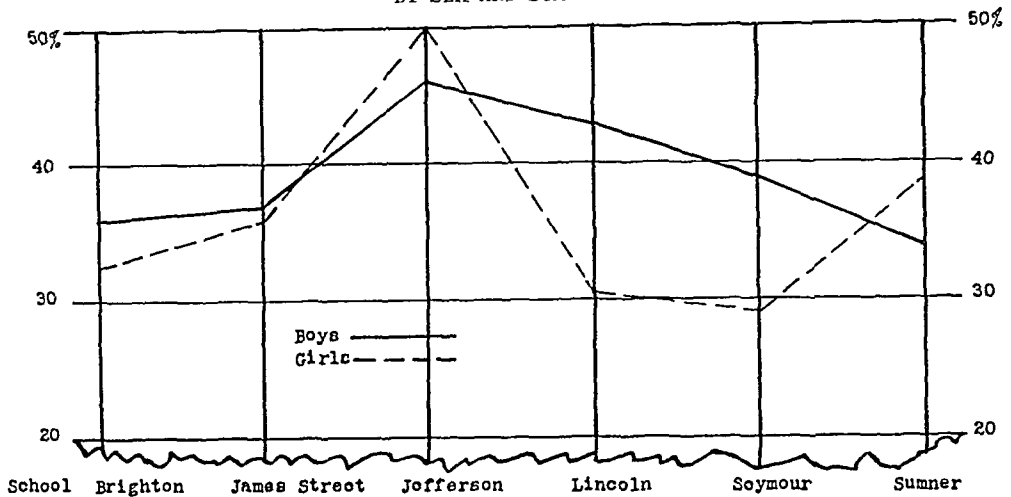
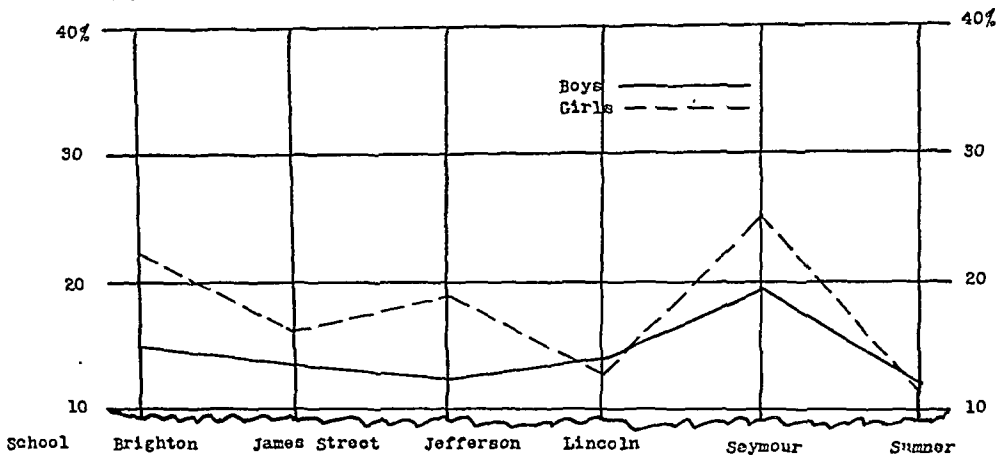


FIGURE VI—PERCENTAGE REFERRED FOR RETRACTION—BY SEX AND SCHOOL



RECOMMENDATIONS

1. That the examination of vision be emphasized as a part of the routine physical examinations in the schools by the school medical supervisor.
2. That besides taking vision at the regular intervals of physical examinations vision also be taken once a year of all the other pupils.
3. That the school nurse be taught how to take and record vision tests.
4. That the apparatus for making vision tests be made standard in all the schools in Syracuse, and that this apparatus be the Snellen test card, mounted according to design in the Department of Health Supervision of School Children and as assembled in the vocational department of the schools.
5. That conditions of lighting the schoolrooms be investigated with a view to improving them.
6. That blackboards and desk tops be finished with dull surfaces to prevent eye strain.
7. That the school textbooks be investigated from the standpoint of visual effort.

EDITORIAL SECTION

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PULLING TOGETHER FOR CHILD HEALTH

A NEW feature of the Annual Meeting in Chicago this year is the occurrence at the same time and place of the annual meeting of the American Child Health Association. Community of interest has led our Child Hygiene Section and this large voluntary association to join hands in the presentation of programs of common appeal. In one or more instances also these sessions are participated in by the Sections of Public Health Nursing, Health Officers and Public Health Education. This action lends strength and richness to the program and to the discussions.

Neither the identity nor independence of thought and action of the participating groups is interfered with by this step and, on the positive side, understanding and singleness of purpose are greatly enhanced.

Great strides have been made in child hygiene in the last 20 years. In fact, the child hygiene program might be called a product of the 20th century. Proceeding along individual lines, divergence in methods and procedures in different communities has been inevitable. The great problem facing the child health worker is so to unravel the connecting threads of cause and effect in order to enable him to identify the activities which are effectual and to distinguish them from efforts that are imposing and theoretically justifiable, but whose results are relatively inconsequential.

These joint programs give a wide array of contributions from leaders in the field of maternal and child hygiene. So accustomed have we become to declining death rates, such as in tuberculosis, diphtheria, and infant mortality, that the failure of a specific cause of death to conform to this tendency challenges our attention. One of the factors that has been particularly difficult to overcome is maternal deaths.

An entire session is given over to this subject. Here the obstetrician, the gynecologist, the official and unofficial health worker, have the opportunity to pool their experiences and seek a strengthened union of effort. Infant hygiene, preschool health supervision, medical, dental and nursing service, and educational methods in health are topics of other sessions which will be discussed from many angles. Out of this exchange of ideas are bound to arise clarification of thought and renewed incentive to productive effort.

A perusal of the preliminary program of the joint meetings discloses that there is an increasing tendency toward critical self-analysis and research—research into the fundamentals. There is also evident an earnest desire to perfect organization and eliminate waste motion. Further, it is apparent that a finer discrimination is being exercised as to what findings from the bacteriological and the social laboratory are suitable for wide application in health practice.

PERMANENCY OF TENURE

AMONG the oldest interests of the American Public Health Association is the attainment of permanency of administrative tenure. It has long been recognized that with frequent shifting of administrative heads continuity of program and satisfactory service for local and state health work are practically impossible. The development of effective community health service depends upon sound policies and practices, well established and accepted generally by the public. Time and steadfastness of purpose both are requisites of community education. It is a matter of general comment that transient tenure, with its attendant political complications and vacillating policies, is the most significant difference between health administration here, in the United States, and that in Europe.

There are enough splendid examples of great accomplishments by health officers who have directed state or local services for continuous periods of twenty-five years or more, to prove the applicability of the principle under our form of government; yet many cities and states continue the wasteful and inefficient practice of changing health officers with every change of general administration.

A committee of the Association, appointed within the year to study and deal with this question, will hold an open conference the first day of the Annual Meeting at Chicago to consider the many aspects of the problem and to receive suggestions as to how such a committee may effectively serve the members of the Association.

This is a question vitally affecting every member of the Association, and to the solution of which all should contribute thought and influence. Your active support of the Committee on the Permanency of Tenure is a necessity.

APPRAISAL OF ADMINISTRATIVE PRACTICE

FOR many years health officers had no special standard by which to judge the efficacy of their work. It is true that conferences were often held, and our own Association, for many years composed almost entirely of health officers, held discussions and doubtless all taking part in them were benefited by the experiences of others. Nevertheless there was no uniform practice and no standard of appraisal, a lack felt by health officers themselves perhaps more keenly than others, though recognized by all interested in the betterment of health administrative work.

Various schemes were devised for the measurement of certain activities, the first one being a score card for dairies, devised about 1903 for use in the District of Columbia. This was soon followed by others, mostly for the grading of dairies and milk supplies, but the first form which covered a wide range of public health work was put out by Dr. Chapin in 1914. Finally in 1920, the American Public Health Association appointed its Committee on Municipal Health Department Practice, and in 1923 the first draft of the Appraisal Form was prepared. In 1925, the Appraisal Form was issued by our Association for experimental use by the health officers of cities. This form with slight modifications has had extensive trial, one of the most notable being the Health Survey of 86 Cities, conducted by the American Child Health Association.

Up to the present, the Appraisal Form has been employed in some two hundred cities varying in size from fifteen thousand up to one and a quarter million inhabitants, and distributed over a large part of the country. These, as well as many other facts concerning the Appraisal Form, have been published from time to time, and are now collected in one volume which is reviewed in this issue of our JOURNAL.¹

Doubtless, the great majority of health officers have followed the development of this method of appraisal, but all will welcome the searching criticism which has been made of its validity, and everyone will be glad to know that we now have an objective measure of the value of public health practices.

The use of the Appraisal Form has passed beyond the experimental stage. Its value has been proved both in practice and by scientific

analysis. Its wider use can be recommended without hesitation. We may also state with assurance that the revision contemplated for the present year will further increase its practical value and confirm the validity of the fundamental principles involved.

1. *The Validity of the Appraisal Form as a Measure of Administrative Health Practice.* (See p. 1324.)

A NEW VIEW OF SMOKING

ONE of the standard gags perpetrated at meetings of scientific men is calling attention to the lack of ventilation and other breaches of sanitary law which may almost always be observed. There is generally truth in the statements made, and frequently the fault lies as much with the building as with the sanitarians who are discussing the welfare of the human race and what should be done or left undone to prolong life. Tobacco smoking in meetings has always, as far as the observations of the writer go, passed unnoticed. There are doubtless a number of persons who object to tobacco smoke and who would prefer to have smoking prohibited, since it is disagreeable to many persons, irritates the throats of others, and sometimes is so thick as to interfere with lantern slide demonstrations, which are bad enough at best, since they usually involve almost complete blocking of ventilation. However, smoking is usually passed by in silence, whatever may be the opinions of certain members of the audience, for several reasons, the chief one being the fear of being considered a crank, while the habit is so general that one feels hopeless of making any change.

These considerations make an address recently given in England particularly noticeable. Before the Southern Branch of the Society of Medical Officers of Health, Dr. Druitt was speaking on smoke abatement from the standpoint of health. A large part of his time was devoted to tobacco smoke and the pollution of the atmosphere produced by it.

While acknowledging the absence of statistics to prove his point, he held that such pollution was at least on "speaking terms" with several serious causes of mortality, among which he mentioned tuberculosis, pneumonia and bronchitis. He further quoted observations indicating not only that the wives of heavy smokers do not produce as many healthy children as those of nonsmokers, but also that the proportion of males is less.

Whatever doubt we may have of the correctness of the observations and the conclusions drawn therefrom, it is certainly inconsistent for health officers and sanitarians who are discussing problems of atmospheric pollution, ventilation, etc., to sit for hours in rooms filled

with tobacco smoke. Surely they, above all others, should set a good example.

The subject is one of particular interest at this time when our daily papers, even those published at universities, give pictures of society women, movie stars and even aviators, who select one brand or the other of cigarettes blindfolded, owing to its alleged superior qualities, and when singers give certificates for other brands because of the soothing effect on the vocal cords, and when the tobacco habit is apparently becoming prevalent among women. That tobacco is a narcotic poison is a statement not disputed by anyone in authority. The late Sir William Osler called attention to the fact that a number of puzzling cases in women in England which were new to the average physician proved to be due to the increase of the smoking habit. The effects of tobacco on the heart, respiration, eyes and vocal cords have long been recognized.

"Scientific evidence is hardly needed to show that to some extent the person breathing a smoke-tainted atmosphere is liable to the same evils as the person who is smoking, for the experience of a non-smoker who has spent an evening in the atmosphere of a smoking concert is often that he sustains a disturbance of health similar to that sometimes complained of by the excessive smoker."¹

We do not believe this is a major point in sanitary advance, but it is certainly worth our while to consider the facts.

1. *Lancet*, Apr. 26, 1913, p. 1181.

ASSOCIATION NEWS

THE A. P. H. A. MEETING

THE scientific program for the 57th Annual Meeting at Chicago this month contains several important symposia. Nearly all of the sessions of the Child Hygiene Section have been built around special topics such as: Maternal Mortality; Dental Hygiene; Efforts to Date to Define Objective Standards in Health Education.

Similarly, the Public Health Engineering Section program has symposia on the Sterilization of Milk Containers and Equipment; a program on Financing Water Supply and Sewerage Projects; a symposium on the Disposal of Phenol Wastes; and one on Shellfish Sanitation. Many others than the engineers will be interested in the reports of the Schoolroom Ventilation Studies which have been carried on in various cities.

Following the successful session on Epidemiology last year, a program of 7 papers on this subject has been prepared for this year. A special session will be held on the subject of Cancer Control. This program is being arranged by the President of the Association and Dr. Charles Mayo.

The recent widespread interest in undulant fever has been recognized by the Laboratory Section, which will present 6 papers on this subject.

In response to the demands from many members of the Association who are active in rural areas, the Health Officers Section has provided a special program on Rural Health Practice.

The importance of accidents as a public health problem will be dealt with in the first session of the Vital Statistics Section.

The Public Health Education Section, continuing its popular luncheon sessions, has devoted two entire sessions to the

consideration of the desirable steps in planning a health education publicity program.

The Preliminary Program of the meeting, which was printed in the September issue of the JOURNAL, lists about 200 papers and reports. The list of authors represents a large proportion of the public health authorities in America.

EXHIBITS

The Tenth Annual Health Exhibit of the Association will be held as part of the 57th Annual Meeting. This exhibit is twice as large as any exhibit ever sponsored by the Association in previous years. The members of the Association and delegates to the meeting will find it most advantageous to visit this exhibit during the morning hours when it is restricted to them. It will be open to delegates from 9 A.M. to 1.30 P.M. and from 5.00 to 7.00 P.M. In the afternoon and evening the exhibit is open also to the public, closing at 10.30 P.M.

Nearly all of the exhibitors who have been with us in past years will also have displays at Chicago, with much new material to show. This year, too, there are a large number of new exhibitors offering a variety of services to the professional public health worker.

In addition to this exhibit, there is a scientific exhibit on the third floor, open to delegates only, and this will include the exhibit on Administrative Practice,* which was so successful last year.

A complete list of the administrative methods being exhibited and the cities or organizations exhibiting will be found on page 1289. Twenty-six separate exhibits are planned to cover the

* The exhibit on Administrative Practice which is a part of the Scientific Exhibit is made possible through the financial assistance of the John Hancock Life Insurance Company and the Milbank Memorial Fund.

fields of general health administration, child hygiene, communicable disease control and epidemiology, health education, organization of state and county health service, sanitation and roadside water supplies, public health demonstrations, Indian nursing service and accident prevention.

The purpose of the exhibit is to acquaint the health officer with new developments, or new ways of doing old jobs, and to present in concrete form information concerning these methods, which will enable the health officer to judge of its applicability to his own local community and organization.

The Committee on Administrative Practice which sponsors the administrative features of this exhibit will appreciate suggestions regarding subject matter and method of display.

If you are interested in spreading information about any phase of public health or public health activities, you are invited by the Public Health Education Section to visit frequently the Education-Publicity Headquarters.

Making statistics graphic, a new type of posters, the latest in diphtheria materials, annual reports, contest ideas, campaign outlines and materials, devices for getting attention and holding it, and examples of good publicity of various types will be features of the display.

The committee in charge will answer questions and offer consultation on health education problems and plans. The committee suggests that you bring along with you a supply of your business cards, with a number written on each one, and when you return home you will receive free copies of such selected items as you indicated you wish to have.

Associations holding related meetings with the A. P. H. A. have also planned special exhibits. The American Child Health Association has arranged an exhibit to interest those attending the meeting in its organization and program.

The important place which social hygiene should occupy in the public health program will be indicated by the exhibit which the American Social Hygiene Association will display at the meeting.

The display will include a new set of statistical charts which has been worked out by the Medical Division of the A. S. H. A., showing the relative prevalence of venereal diseases in the United States and Great Britain, with interesting figures on the influence of efforts to control these diseases. Some of the exhibit material on syphilis, gonorrhea in the male, and gonorrhea in the female which has been shown by the association at annual meetings of the American Medical Association also will be on view in Chicago.

In order that "he who runs may read" the A. S. H. A. will distribute at the exhibit booth small packets containing information about the purpose and scope of its program. Much interest has been evidenced in the reading lists, which are among the circulars included in these free envelopes.

Copies of the books and pamphlets on the control of venereal diseases, social hygiene legislation and sex education will be available for examination at this booth.

A copy of the association's film "Public Health Twins at Work," revised, with up-to-date statistics, will be shown with the films which the National Health Council is displaying at the conference. Information regarding other social hygiene films which the association distributes will be available at the exhibit booth. The attendants will be prepared to discuss any social hygiene problems with which sanitarians are confronted.

BOOK EXHIBIT

The seventh annual exhibit of new books on public health, arranged under the auspices of the Book Service of the Association, will be well worth several

visits. It will be found in Wall Exhibit D in the exhibit hall. More than 60 publishers are sending their newer books for the display aggregating 500 volumes. The Book Exhibit has been arranged for the entertainment and education of delegates, as well as to help those who desire to purchase the latest titles in preventive medicine, laboratory methods and findings, food, drugs and nutrition, mental hygiene, social hygiene, health books for children, etc. You are invited to spend as much time as you can at the Book Exhibit. There will be an experienced librarian in charge, who will be glad to answer your questions and advise you in the selection of the best and newest books.

SCIENTIFIC EXHIBIT

Third Floor, North Assembly Room
Corridor and South Assembly
Room

Booth

- | Number | Administration |
|---------|--|
| 17 | Administrative Methods—
Charleston, S. C. |
| 16 | Visible Record Display Cab-
inet—Columbus, O. |
| 14 & 15 | County Health Centers—
County Health Depart-
ment, Los Angeles, Calif. |
| | <i>Child Hygiene</i> |
| 3 | Blue Ribbon Campaign—Sid-
ney, O. |
| 4 | Children's Bureau—Washing-
ton, D. C. |
| 1 | School Health Examination
—Racine, Wis. |
| 2 | Summer Preschool Round-up
—Newkirk, Okla. |
| 5 | Infant Welfare Clinics—
Cleveland, O. |
| | <i>Communicable Disease Con-
trol and Epidemiology</i> |
| 6 | Typhoid Carriers and Cream
Cheese Epidemic—Minne-
sota State Health Depart-
ment. |
| 7 | Septic Sore Throat Epidemic
—Massachusetts State
Health Department. |

- | | |
|-------|--|
| 13 | Communicable Disease Con-
trol—Manchester, N. H. |
| 12 | Communicable Disease Rec-
ord Forms—Providence,
R. I. |
| 10 | Diphtheria Control—Niagara
Falls, N. Y. |
| 11 | Diphtheria Prevention—Lex-
ington, Ky. |
| 8 & 9 | Diphtheria, Measles and
Rabies Control Methods—
Detroit, Mich. |

Health Education

- | | |
|---------|---|
| 26 & 27 | Health Education in Clinics
—New York Tuberculosis
and Health Association,
New York, N. Y. |
| 25 | Public Health Education—
American Medical Associa-
tion, Chicago, Ill. |
| 18 | Vital Statistics—Health De-
partment, Chicago, Ill. |

Laboratory

- | | |
|---------|---|
| 22 & 23 | Microscopic Slide, Precipita-
tion Test—Mt. Sinai Hos-
pital, Cleveland, O. |
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Organization

- | | |
|----|---|
| 20 | County Health Organization
—Pontiac, Mich. |
| 21 | Organization and Functions
—Illinois State Health De-
partment. |

Sanitation

- | | |
|----|---|
| 29 | Roadside Water Control—
Pennsylvania State Health
Department. |
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Accident Prevention

- | | |
|----|---|
| 28 | Accident Prevention—Na-
tional Safety Council. |
|----|---|

Health Demonstrations

- | | |
|----|---|
| 24 | The New York Health Dem-
onstrations.
Cattaraugus County, N. Y.—
Syracuse, N. Y.—Bellevue-
Yorkville, New York, N. Y. |
|----|---|

Nursing

- | | |
|----|--|
| 30 | Indian Nursing Service—
Minnesota State Health
Department. |
|----|--|

RELATED MEETINGS OF A. P. H. A. IN
CHICAGO

This year 9 public health organizations will hold related meetings with the A. P. H. A. when it convenes at Chicago, October 15-19, for its 57th Annual Meeting.

The preliminary program published in the September issue of the JOURNAL announced the time and place of joint sessions and individual meetings of a few of the organizations scheduled.

In addition to these the following have announced their dates of meeting:

International Association of Dairy and Milk Inspectors (17th Annual Meeting), October 11, 12, 13, Hotel Stevens.

Association of Women in Public Health, Dinner Meeting, October 17, Hotel Stevens.

Conference of State Sanitary Engineers, October 13-15, Hotel Stevens.

State Laboratory Directors Association, October 15, 10.00 a.m. and 1.30 p.m., Luncheon Meeting, Hotel Stevens.

MEETING OF AMERICAN ASSOCIATION OF
SCHOOL PHYSICIANS
HOTEL STEVENS

Monday, October 15, 9:30 A.M.

Welcome Address. DR. ARNOLD H. KEGEL, Commissioner of Health, Chicago, Ill.

Standards for Medical Inspection and Health Service in Teacher Training Institutions (Report of Committee). DR. A. O. DEWESSE, Kent State Normal College, Kent, O.

Discussion. DR. GRACE S. WIGHTMAN, Illinois State Health Department.

Educational Qualifications for School Physicians. DR. HAVEN EMERSON, New York, N. Y.

Standard Forms and Methods in School Medical Inspection. DR. J. BRUCE MCCREARY, Pennsylvania State Health Department, Harrisburg, Pa.

When Should We Operate on Tonsils? DR. PORTER B. BROCKWAY, Toledo, O.

Open Air School Ventilation. DR. L. W. CHILDS, Cleveland, O.

One hour of each session will be devoted to brief reports by school physicians doing outstanding work.

2:00 P.M.

1. A Model School Medical Inspection Program.

(a) *In First Class Cities.* DR. JOHN A. CECONI, Boston, Mass.

(b) *In Second Class Cities.* DR. F. S. BURKE, Toronto, Ont.

(c) *In Third Class Cities.*

(d) *In Rural Communities.* DR. B. T. McDOWELL, Canandaigua, N. Y.

2. Mental Hygiene in Education. Suggestions to School Physicians. DR. CLINTON P. MCCORD, Albany, N. Y.

3. How Can the Nurse Best Assist the School Physician? HELEN F. MCCAFREY, R.N., Boston, Mass.

Dinner Session, 6:30 P.M.

Selection and Management of Cardio-pathic Cases. DR. SVEN LOKRANTZ, Los Angeles, Calif.

The Important Contributors to a School Health Program. CLAIR E. TURNER, Dr.P.H., Cambridge, Mass.

Medical Leadership in School Medical Inspection and Health Service. DR. HAVEN EMERSON, New York, N. Y.

DR. J. S. FULTON, MARYLAND'S HEALTH OFFICER, RESIGNS

Maryland's success in developing its public health program has been due to a great degree to the efforts of John Samuel Fulton, M.D., who, after 30 years' service, has resigned as health director of Maryland.

Dr. Fulton was born in Fremont, O., in 1859.

He was appointed State Health Officer of Maryland, September 17, 1896.

In 1898, Dr. Fulton secured the appointment of Dr. William H. Welch as a member of the State Board of Health, in which capacity he is still serving, and he was president of the board until the reorganization of the entire state government by the Governor of Maryland in 1922. Since January 1, 1923, when the reorganization became effective, Dr. Welch has been a member of the board of health and Dr. Fulton has been the director and chairman of the board.

As a result of legislation passed in 1904 requiring the registration of all living cases of tuberculosis, Maryland

was the first state to register cases of tuberculosis. Other states followed Maryland's example.

Following the enactment of this law, Dr. Fulton brought about the first tuberculosis exhibition held in Maryland in the spring of 1904. It was at this exhibition that a few leading persons interested in the subject of tuberculosis formed what proved to be the nucleus of the National Tuberculosis Association.

In 1906, Dr. Fulton was elected Secretary-General of the Sixth International Congress on Tuberculosis, which was held in Washington in 1908.

The committee, selected to make plans for the Fifteenth International Congress on Hygiene and Demography in Washington in 1912, named Dr. Fulton as its head.

Dr. Fulton was President of the Conference of State and Provincial Health Authorities of North America in 1905. During the World War he enlisted in the Medical Reserve Corps, U.S.A., and became Lieutenant-Colonel. He served full time at headquarters in Washington and also carried on the activities of the State Department of Health after office hours. He has been Professor in State Medicine at the University of Maryland Medical School and lecturer in the Johns Hopkins School of Hygiene and Public Health. He is a member of the American Association for the Advancement of Science, National Tuberculosis Association, Hygiene Reference Board of the Life Extension Society, Inc., Honorable Member of the Royal Hungarian Society and a Fellow of the Royal Institute of Public Health, Great Britain. He is a Fellow of the American Public Health Association.

No doubt one of the greatest tributes paid to him comes from his fellow workers for the last quarter of a century, expressed in a resolution made by the State Board of Health on receipt of his resignation last May from the directorship of the public health of Maryland.



JOHN SAMUEL FULTON, M.D.

Dr. Robert H. Riley, who was trained by Dr. Fulton, was appointed as his successor.

DR. C. O. SAPPINGTON APPOINTED BY NATIONAL SAFETY COUNCIL

C. O. Sappington, M.D., Dr.P.H., has been appointed Director of the Division of Industrial Health at the National Safety Council, Chicago, Ill. This division has just been created, and Dr. Sappington is the first director.

DR. J. H. SHRADER JOINS NATIONAL DAIRY PRODUCTS CORPORATION

J. H. Shrader, Ph.D., Director, Bureau of Chemistry and Food, Health Department, Baltimore, Md., has accepted the presidency of the Research Laboratories of the National Dairy Products Corporation, Inc. Dr. Shrader's resignation from the Baltimore Health Department became effective August 31. The new laboratories will be located in Baltimore and the work there will be

directed toward the improvement of dairy products. Dr. Shrader is Chairman of the Food, Drugs and Nutrition Section of the American Public Health Association.

DR. LINSLEY R. WILLIAMS LEAVES N. T. A.
DR. KENDALL EMERSON HIS SUCCESSOR

Linsley R. Williams, M.D., since 1922 Managing Director of the National Tuberculosis Association, has resigned, his resignation to take effect October 1. Because of the increasing pressure of work in the several professional and public health activities in which he is engaged Dr. Williams decided several months ago that as soon as his successor could be found he would leave the N. T. A.

Dr. Williams is director of the New York Academy of Medicine, president of the New York Tuberculosis and Health Association, and a trustee of Columbia University. He is a Fellow of the American Public Health Association. Since 1904 he has been a member of the Board of Managers of the New York Association for Improving the Condition of the Poor. Following his service during the World War as assistant division surgeon of the 80th Division, Dr. Williams was made director of the Rockefeller Tuberculosis Commission in France. In 1914, he retired from the practice of medicine to accept the appointment of deputy commissioner of the New York State Department of Health in which capacity he served until 1917. Dr. Williams has been connected with the Vanderbilt Clinic of the College of Physicians and Surgeons, Columbia University, for several years and has been associated with several sanatoria for tuberculous patients. He was also one of those responsible for the creation of the New York Milk Committee.

Dr. Kendall Emerson of Worcester, Mass., has been elected to succeed Dr. Williams as Managing Director of the

N. T. A. Dr. Emerson is a graduate of Amherst College and of Harvard University Medical School. He has been active in the national tuberculosis program for several years, having served consecutively as chairman of the Worcester, Mass., County Tuberculosis Association, director of the Massachusetts Tuberculosis League, president of the league and representative director of the N. T. A., becoming member of the executive committee of the association last year. During the World War Dr. Emerson served with the Royal Army Medical Corps and the U. S. Army Medical Corps, later going to Siberia for the Red Cross. For two years after the armistice he acted as deputy commissioner and director of the medical service for Europe in Paris under the direction of Robert F. Olds.

DR. M. M. SEYMOUR RESIGNS FROM
PROVINCIAL HEALTH POST

Maurice McDonald Seymour, M.D.C.M., D.P.H., LL.D., whose activities in the public health work of Canada for more than 20 years have brought him prominence among sanitarians in the United States and Canada, has resigned as Deputy Minister of Health of the Province of Saskatchewan. Dr. Seymour has reached the retirement age but he will be retained by the provincial government as adviser on health matters until November.

Dr. Seymour is a Fellow of the American Public Health Association and served as vice-president of the Association for one year. He has also served as president of the Canadian Public Health Association. With the establishment of the Department of Health of Saskatchewan in 1922, Dr. Seymour was appointed deputy minister, thus becoming a member of the Dominion Council of Health. In 1926 he was elected president of the Conference of State and Provincial Health Authorities of North America.

Dr. Seymour was chosen in 1923 to represent Canada on the Health Section of the League of Nations and with representatives of 18 other countries made a health survey of the United States, after which Europe was visited and the representatives attended a conference at the League headquarters in Geneva. In 1920 he was made a Fellow of the Royal Institute of Public Health in England.

Dr. Seymour was born in Goderich, Ont., in 1857 and received his early education at Assumption College, Sandwich, Ont. He was graduated from the medical college of McGill University in 1879 where he received his degree of M.D.C.M. He obtained his degree of Doctor of Public Health from the University of Toronto. Ottawa University conferred upon him the degree of LL.D.

He was appointed Commissioner of Public Health for the Province of Saskatchewan in 1906 and in that same year he was instrumental in organizing the Saskatchewan Medical Association.

Dr. Seymour has always taken a keen interest in the fight against tuberculosis



MAURICE M. SEYMOUR, M.D.

and through his foresight and by his energy the Saskatchewan Anti-Tuberculosis League was organized and the first tubercular sanatorium in that province was built.

MEETINGS OF AFFILIATED SOCIETIES

Society	Secretary	Place and Time of Annual Meeting
Connecticut Public Health Association	Richard W. Pullen, M.D.	
Massachusetts Association of Boards of Health	Stephen L. Maloney	Boston, January 24, 1929
Michigan Public Health Association	W. J. V. Deacon, M.D.	
Missouri Public Health Association	R. L. Laybourn	Jefferson City, April or May, 1929
New Jersey Public Health and Sanitary Association	Edward Guion, M.D.	Princeton, December 7-8, 1928
New Mexico Public Health Association	Paul S. Fox	Carlsbad, May, 1929
Northern California Public Health Association	William P. Shepard, M.D.	
Ohio Society of Sanitarians	E. R. Shaffer, M.D.	Columbus, November 7, 8, 9, 1928
Pennsylvania Public Health Association	William C. Miller, M.D.	Altoona, February, 1929
Southern California Public Health Association	H. A. Young	
Texas Association of Sanitarians	E. G. Eggert	San Antonio, November 7-10, 1928
Virginia Public Health Association	P. S. Schenck, M.D.	
West Virginia Public Health Association	Ellis S. Tisdale	Morgantown, November 27-29, 1928

NEW MEMBERS

- Edna Abbott, Roanoke Rapids, N. C., School Nurse
- Leon Adler, Indianapolis, Ind., Manager National Motion Pictures Company (Assoc.)
- Lyda W. Anderson, R.N., Detroit, Mich., Executive Secretary Michigan State Nursing Association
- Gean S Atkinson, M.D., Muskogee, Okla., Superintendent of Health, Muskogee County
- Alphonse Barabe, M.D., Riviere du Loup, Quebec, Canada, Health Commissioner
- George D. Beal, Ph.D., Pittsburgh, Pa., Assistant Director Mellon Institute of Industrial Research
- J. B. Berteling, M.D., South Bend, Ind., Health Officer
- Patrick C. Bruno, Revere, Mass., Agent Board of Health and Milk Inspector (Assoc.)
- Frank H. Collins, M.S., Sioux City, Ia., Commissioner of Public Health
- Oscar Costa-Mandry, San Juan, P. R., Associate in Bacteriology, School of Tropical Medicine, University of Porto Rico
- Marion E. Davey, S.B., Toledo, O., Nutrition Teacher, Toledo District Nurse Association
- Fernando del Pino, M.D., Havana, Cuba, Director of Hospitals and Asylums
- Hampton W. Edwards, M.D., Frazer, Ky. (Assoc.)
- Lacy H. Elrod, B.S., Nashville, Tenn., in charge of Health Department, Central Church of Christ
- Howard R. Estes, B.S., New York, N. Y., Staff Associate American Child Health Association
- Guillermo Lage y Fernandez, Havana, Cuba, Auxiliary Supervision of Foods and Drugs
- William I. Fishbein, M.D., Chicago, Ill., Physician, Laboratory Schools, University of Chicago
- Alfred H. Fletcher, B.S., Monroe, La., Assistant Sanitary Engineer, State Board of Health
- J. M. Frazier, M.D., Belton, Tex., Teacher of Physiology, Hygiene and Bacteriology, Baylor College
- Joe Gilbert, M.D., Austin, Tex., Member State Board of Health
- O. O. Hammonds, M.D., Oklahoma City, Okla., State Health Commissioner
- William L. Hart, M.D., Chicago, Ill., Medical Inspector, U. S. Army
- Wilbur M. Heaton, Pueblo, Colo. (Assoc.)
- John A. Henderson, Wyandotte, Mich., Director of Health Education
- Juan A. Hernandez, Havana, Cuba, Civil Engineer, Department of Public Health
- Clarence F. Holtegel, M.D., Paintsville, Ky., Director Johnson County Health Unit
- Edgar B. Kay, C.E., Washington, D. C., Consulting Engineer, Pittsburgh-Des Moines Steel Company
- Emily L. Ketcham, M.S., Syracuse, N. Y., Supervisor of Nutrition, Department of Health and Syracuse Health Demonstration
- Anna Koch, R.N., Greenfield, Mass., Director Visiting Nurse Association
- Francisco P. Lopez Silvero, M.D., Havana, Cuba, Chief, Health Department
- Daisy Manley, Hartford, Conn., Staff Nurse
- William C. Marti, B.S. in C.E., Chicago, Ill., Principal Chemist, Department of Health
- Fred Moore, M.D., Des Moines, Ia., Director Health Department of Public Schools
- Sharajit K. Mukerjee, Calcutta, India, Director of Physical Education, Y. M. C. A. (Assoc.)
- S. Weir Newmayer, M.D., Philadelphia, Pa., Supervisor Medical Inspection of Schools
- P. R. Outlaw, M.D., El Paso, Tex., Health Officer
- Wesley W. Polk, B.S., Evanston, Ill., Superintendent Water Department
- Grace H. Pollock, A.B., Pittsburgh, Pa., Nutrition Department, Pittsburgh District Dairy Council
- Alonzo A. Ross, M.D., Lockhart, Tex., Member State Board of Health
- Rafael F. Santa Maria, Havana, Cuba, Meat Inspection Supervisor
- Warren J. Scott, Hartford, Conn., Director Bureau of Sanitary Engineering, State Department of Health
- Richard G. Soutar, Jr., M.D., Sacramento, Calif., Director Public School Health Department
- Marjory Stimson, B.S., New York, N. Y., Assistant to Director, National Organization for Public Health Nursing
- Ruth Strang, Ph.D., New York, N. Y., Research Associate, Teachers College, Columbia University
- Sidney Strauss, M.D., Chicago, Ill., Secretary Chicago Heart Association (Assoc.)
- C. J. Taugher, M.B., Milwaukee, Wis., Bacteriologist
- Florence E. Taylor, Walton, N. Y., School and General Public Health Nurse
- Vsevolod E. Timonoff, Leningrad, U. S. S. R., Member Board of Public Health Congresses (Assoc.)
- Robert B. Watson, B.S., C.P.H., Newark, N. J., Industrial Secretary New Jersey Tuberculosis League

Ruth Watson, New York, N. Y., Director Education Department, Royal Baking Powder Company

Paul L. Weir, B.S. in C.E., Atlanta, Ga., Bacteriologist, Water Works

Emanuel J. Wexler, M.D., Niles, Ill., Commissioner of Health

E. W. Wright, M.D., Bowie, Tex., Member State Board of Health

Howard E. Wright, M.D., Princeton, N. J., School Medical Inspector

APPLICATIONS FOR FELLOWSHIP

PUBLIC HEALTH EDUCATION SECTION: Richard O. Beard, M.D., Minneapolis, Minn.

PUBLIC HEALTH NURSING SECTION: Elizabeth L. Smellie, R.N., Ottawa, Ont.

NEW A. P. H. A. BOOK LIST

The new *Catalogue of Health Books* of the A. P. H. A., carrying 773 titles, is ready for distribution. The Book List this year includes 53 more titles than the list of 1927. It suggests titles in the fields of child, maternity and school hygiene; food, nutrition and drugs; health education; industrial hygiene; laboratory; mental hygiene; nursing; personal hygiene; preventive medicine and public hygiene; public health engineering; social hygiene and eugenics; tuberculosis; vital statistics; reference and medical history.

This bibliography on public health is prepared for the purpose of aiding the public health worker to find the sources that will be most helpful to him in his special field of work. In the preparation of this list the American Public Health Association does not assume the responsibility of endorsing these titles—the list is compiled only as a suggested bibliography. However, a committee on public health books, which includes specialists in every field listed in the bibliography, have given assistance

in its compilation, and the Association is grateful to them for their suggestions.

The publishers' output this year has, to a degree, influenced the increase of titles appearing in the following sections of the bibliography: Preventive Medicine; Laboratory; Mental Hygiene; Personal Hygiene; Child, Maternity and School Hygiene; Health Education; Nursing; Reference Books and Medical History.

The new book list will be mailed to members of the A. P. H. A. and distributed at the Book Exhibit at the 57th Annual Meeting at Hotel Stevens, Chicago, Ill., where selection of the books listed may be made.

DEATHS OF A. P. H. A. MEMBERS

John Archibald Smith, Secretary of the American Heart Association since February, 1928, died suddenly on August 20. Dr. Smith was Secretary of the New York State Department of Health from 1917 to 1921.

Cressy L. Wilbur, M.D., for many years one of the most widely known vital statisticians in the world, died on August 9, 1928, of pneumonia. He served as Chief of the Division of Vital Statistics of Michigan, 1893 to 1905, and, as Chairman of the American Public Health Association Committee on Vital Statistics, secured the government's adoption of the International Classification of Causes of Death.

Edward A. Holmes, M.D., Health Officer of Colchester, N. Y., since 1901, died on August 19, 1928. Dr. Holmes also served as Health Officer of Downsville, N. Y., since May, 1921.

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

Preventive Medicine—The need of effectively controlling cults and pseudo “practitioners” of medicine by enlisting the coöperation not only of the medical profession, but also the leaders of community thought, is emphasized. Development of public health administration in this country has not infrequently been of the hit-and-miss type, resulting in a crazy quilt pattern of administration. Even in the large cities the health administrator is frequently one who has not qualified as a student in public health science and has but infrequently obtained the degree conferred upon those who study in our better grade institutions of learning. Governmental guidance would do much to prevent such haphazard development in the administrative field and would be effective in preventing many needless epidemics such as the Montreal typhoid situation of last year. The Federal Department of Health might very well have the effect of establishing a standard in public health work analogous to the service that is rendered by the Bureau of Standards with respect to basic weights and measurements. The position of the administrator in England is a striking contrast to the chaotic condition that prevails in this country. A more effective and wholesome respect for public health work can be inculcated into the medical profession by the teaching of preventive medicine at medical centers.—Louis I. Harris, M.D., *Proposals for the Next Steps in Preventive Medicine and Public Health, J. A. M. A.*, XCI: 529 (Aug. 25), 1928.

Control of Typhoid Fever—In the monthly bulletin of the New Haven Department of Health for August, 1928,

the story of typhoid fever in New Haven is traced from the year 1873 down to date. It shows that in those early years, 1873, 1874 and 1875, unquestionably typhoid was due in a large measure to the filthy condition of the soil of the city from privy vaults and the drainage of these vaults finding its way into wells. It was not until 1893 that the Common Council passed an ordinance compelling the sewer connection of all premises, or abolishment of all privy vaults and cesspools on sewered streets within 50 feet of any house. In 1896, the first milk epidemic was recorded. In 1901, 696 cases and 101 deaths from this disease occurred in the city, most of which were traceable to the pollution of Lake Dawson, a reservoir of the water supply, by the washing of excreta from the watershed into this reservoir. Milk infection from two different farms was reported in 1906, and 1911 showed a milk infection traced back to a privy vault. In 1914, all privy vaults on sewered streets were ordered abolished, and in 1915 a typhoid carrier was found in one of the wards. In the years 1915 to 1917, other equally dangerous vaults were found to be centers of summer typhoid and were abolished. Likewise in 1924 and 1927 a cesspool and an old privy vault temporarily used as a comfort station were found to be centers of infection.

Thus, the bulletin concludes, it has come to pass that the main paths of the causes of typhoid fever have been increasingly blocked by administrative action eliminating privy vaults, cesspools, and wells, and by throwing all known safeguards upon milk production. Further, a public service corporation, the New Haven Water Company, has made all storage drinking water adequately safe by clearing all the watersheds of any inhabitant.

In this review of New Haven's typhoid history there is a summary of the administrative practices which health officers must continually keep in working order to protect their communities.

Goiter Prevention—The author concludes that there is no basis for the statements that iodized salt may induce hyperthyroidism. The etiology of hyperthyroidism lies within the individual. These etiological factors are increased or aggravated by endemic goiter, and by preventing endemic goiter we are thereby preventing, in the future, many cases of hyperthyroidism. These conclusions are the result of a goiter survey of school children made in 4 counties and several urban communities in Michigan in 1924, and a re-survey in 1928. Iodized salt has been in rather general use in this state during that period. In Midland County it was found that of 3,645 school children examined in January, 1924, 41.6 per cent had goiter. A re-survey in January, 1928, showed that 91 per cent of the homes of the public school children used iodized salt. The incidence of goiter among children had decreased to 8.8 per cent. In Wexford County the first examination showed 55.5 per cent to be goitrous and in the re-survey 17.3 per cent had goiter. In the city of Grand Rapids, 1923, 30 per cent of 26,215 pupils had goiter, while a re-survey showed the percentage of goiter of 9. It was found that 91 per cent of the homes of public school children were using iodized salt.

The author analyzes the effects of iodized salt on adults with goiter and concludes that there is no indication of any danger from the use of such salt.—O. P. Kimball, *Efficiency and Safety of the Prevention of Goiter, J. A. M. A., XCI: 454 (Aug. 18), 1928.*

Cancer Control—A special study has been made of the methods of cancer treatment and control in 20 average American cities ranging in population from 100,000 to one million. It was recommended that the records of cancer cases should be pooled through individual follow-up reports or through a central bureau embracing the hospitals of the city. Also, there should be more concentration on the laboratory diagnosis of cancer, especially in smaller communities. Cancer clinics, to function properly, must be carefully established and must proceed slowly. There should be physicians having a proper pathological understanding of cancer, capable of treating cancer or developing into experts. In some of the large hospitals it would be well to refer cancer cases to groups of certain physicians on the staff who have the time and inclination to study such cases. In some communities it would be better if early cancer were not treated, the patients being sent instead to a nearby center where facilities and the opportunity for wide experience with the disease are more easily obtained.—Harry C. Saltzstein, M.D., *Average Treatment of Cancer, J. A. M. A., XCI: 465 (Aug. 18), 1928.*

LABORATORY

C. C. YOUNG

COMPARATIVE RESULTS IN THE BACTERIOLOGICAL EXAMINATION OF FECES

AUBREY H. STRAUS, FELLOW A. P. H. A., and FORREST SPINDLE

Laboratories, Virginia State Department of Health, Richmond, Va.

THE excellent results obtained by the use of brilliant green bile in the bacteriological examination of feces published by Havens¹ has naturally attracted much interest among public health laboratory workers. As most public health laboratories have for some years employed the method described by Teague,² that is, the use of 30 per cent glycerine, the question has naturally arisen as to which of these two methods would give the most satisfactory results under practical working conditions.

In an endeavor to determine this point a series of comparative specimens has been obtained. Dr. Havens was kind enough to supply us with brilliant green bile prepared in his laboratory for this purpose. Two different batches of brilliant green bile were received and used, but Dr. Havens has subsequently stated that the dye used in this media was from one of the poorest lots he has had. A special outfit for collecting samples was used containing two identical bottles, one of which contained 30 per cent glycerine and the other brilliant green bile, approximately the same amount of fluid, 8 to 10 c.c., being put into each bottle. These containers were supplied to our epidemiological department and also to our county health officers. They were requested when obtaining specimens of feces to put as nearly as possible the same amount of material into each bottle, the specimens then being mailed to the laboratory.

The quantity of feces used was in most cases quite small, about the size of a pea.

Upon arrival at the laboratory the specimens were immediately plated, successive platings being made the day following arrival and the day after that, so that each specimen was plated on three successive days. The specimens from the glycerine were plated only on eosin-methylene-blue agar, this being the usual custom in this laboratory. The specimens in the brilliant green bile, however, were plated both on eosin-methylene-blue agar and on Krumwiede's brilliant green agar according to the method described by Havens. That is, we endeavored to follow Havens' technic exactly on the brilliant green bile specimens, at the same time plating them also on eosin-methylene-blue agar for comparative purposes.

While large numbers of these containers were sent out, up to the present time only 52 specimens have been returned to the laboratory. The specimens came from 34 cases of suspected typhoid fever, 5 cases of suspected dysentery, 12 suspected carriers and 1 of unknown origin. All positive specimens came from clinical cases.

The results of these 52 comparative tests are as follows:

Specimens Examined	
52	
Number Positive for Typhoid	
(a)	(b)
Brilliant green bile	Glycerine
10	18

One specimen found positive by method (a) was negative by (b), but 9 specimens positive by method (b) were negative by (a). There were likewise 3 cases of Flexner dysentery found positive by method (b), which were not found by the brilliant green bile method.

It is also interesting to note that the specimen positive in the brilliant green bile only was likewise positive only on the brilliant green agar plates, the eosin-methylene-blue plates being negative. In one other case positive colonies were obtained from the brilliant green agar and not on the eosin-methylene-blue, but in all other cases the eosin-methylene-blue plates gave excellent results.

Thirteen specimens from the brilliant green bile showed no growth on any plate. In no case was there any evidence of overgrowth.

In all 3 cases showing Flexner dysentery no growth was obtained from the brilliant green bile, while positive results were obtained from the glycerine at the end of three days, the plates showing almost pure cultures of dysentery bacilli.

SUMMARY

The bacteriological examination of feces in the State of Virginia is carried out both for diagnosis and for the finding of carriers. Bacillary dysentery is more common than typhoid fever, and carriers of this disease are likewise, in our observation, more numerous than carriers of typhoid. Brilliant green bile is not suitable for the examination of specimens for bacillary dysentery. It, likewise, did not in this series give as good results in the examination for typhoid as did 30 per cent glycerine.

While it is realized that this series of results is small they are nevertheless significant and the examinations have been made under practical working conditions. It is, therefore, our opinion that 30 per cent glycerine is decidedly superior to brilliant green bile as a practical method in public health practice.

REFERENCES

1. Havens and Dehler. *J. Lab. & Clin. Med.*, 10:238, 1924; *A. J. P. H.*, 16:948, 1926.
2. Teague and Clurman. *J. Infect. Dis.*, 18:653, 1926.

A SIMPLE DILUTION BOTTLE STOPPER ARRESTOR

MILTON E. PARKER

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A SIMPLE dilution bottle stopper arrestor can be made by means of a small piece of 6 mm. glass rod. By bending the glass rod into a series of suitable angles, as shown in Figure I, and inserting one end into the single opening of a one-holed No. 2 rubber stopper, the appliance is complete.

The original purpose of devising such an appliance was to permit the preparation of dilutions of ice cream samples by weight. By means of suitable carrier pans designed to hold one Pyrex dilution bottle each with load of 100 gm., it was found convenient to utilize a torsion balance sensitive to 0.01 gm. The stopper arrestor provides the means

of maintaining the tare without the danger of contamination.

FIGURE I

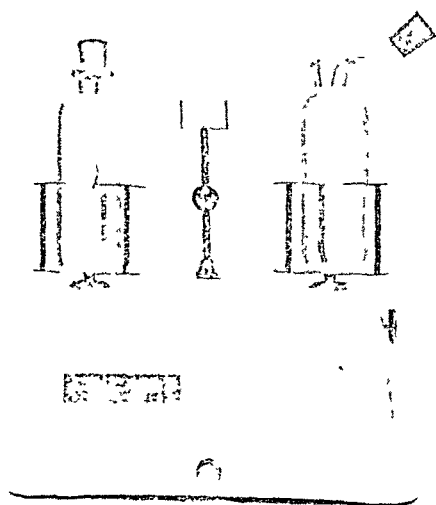


STOPPER ARRESTOR FOR USE WITH PYREX
DILUTION BOTTLE
(Half Size)

Reference to Figure II will demonstrate the ability of the stopper arrestor in the preparation of ice cream sample dilutions by weight without the danger of contamination.

In Figure II the Pyrex dilution bottle on the left shows the position of seal of

FIGURE II



Courtesy of Torsion Balance Company

ASSEMBLED EQUIPMENT FOR PREPARATION OF
ICE CREAM SAMPLE DILUTIONS BY
WEIGHT

the stopper and arrestor before and after dilution, while the bottle on the right indicates the positions of stopper

and arrestor during diluting by weight. In our laboratory we prepare the dilution bottles with 90 c.c. of sterile distilled water and use 10 gr. of melted ice cream for preparing an original 1/10 dilution. All other dilutions are prepared from this original dilution.

Additional advantages of the stopper arrestor have come to our attention with the use of this appliance. It was found that with the considerable ejection of non-absorbent stoppers during autoclaving, this could be reduced to a minimum by means of the arrestor, with never an instance of the stopper leaving the bottle entirely. A quick tap at the top of the stopper with a glass rod will invariably return the stopper to the position of seal, thus maintaining sterility. Furthermore, in the actual manipulations during diluting, plating, etc., it makes it possible to prepare and withdraw portions for plating without removing the stopper entirely from the bottle, thereby again reducing possibilities of contamination during the execution of the usual details of bacteriological laboratory technic.

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

The Health of Calcutta—The latest available annual report of Calcutta is for the year 1925, published in 1927. Calcutta has an area of 30 square miles and a population of over a million; a birth rate of 19, a death rate of 33, and an infant mortality of 326. The population should therefore be decreasing by no less than 15,000 per annum. There are about twice as many males as females, and the death rate of females is nearly double that of males. The death rate of the Mohammedans is considerably higher than that of the Hindus, and

the infant mortality of the former 429, against 306 of the latter. The birth rate when calculated from the number of women of childbearing age is 59 for Hindus, 65 for Mohammedans, 52 for Anglo-Indians and 61 for Indian Christians. There is a seasonal variation for births, the rates being low in summer and high in winter.

In 1925 there was a severe epidemic of smallpox of very virulent type, causing a death rate of 3.6 per 1,000. The disease of kala-azar has been increasing steadily during the past seven years.

The death rate from this is now seven times what it was 17 years ago. The disease is about twice as fatal in Anglo-Indians and native Christians as in Hindus and Mohammedans.—*Med. Off.*, 40: 25 (July 21), 1928.

Toxemia in Pregnancy—Over 70 per cent of the cases studied were primiparae, and more than 50 per cent were between the ages of 25 and 35 years. In a number of cases there was a family history of toxemia, most often of the patient's mother. Fibroids were noted in 5 cases. There were twins in 3 cases. Convulsions took place in 8 primipara cases and in 1 multipara, with one death, a primipara. There were 22 chronic nephritics with 3 deaths occurring among them. One hundred fifty-six pregnancies were recorded in 56 cases. Ninety-eight babies lived, and 61 pregnancies terminated in death to the fetus.

An analysis of 400 consecutive cases coming for delivery showed that 5.5 per cent developed toxemia. Of these, 4.25 per cent were acute toxemic cases and 12 per cent of the cases were recurrent toxemias. The toxemics who have had prenatal treatment and develop convulsions suddenly, because of an acute fulminating condition, have a better chance of surviving, if properly treated, than those who have not had this care.

Although toxemic symptoms should be treated in a hospital, operative intervention is not necessary unless symptoms increase. In toxemias developing prior to six and a half months, the danger of eclampsia is too great to allow the pregnancy to continue. Delivery before severe toxemia develops will reduce maternal mortality.—Reginald D. Mergeson, *New England J. Med.*, 198: 735–739 (May 24), 1928.

Infant Mortality—Figures for New Zealand show that infantile mortality has fallen from 100 in 1880 to 40 in

1926; the deaths of infants 1–2 months, from 67 to 14; the deaths of infants under 1 month, from 29 to 25. But the stillbirths have risen from 23 to 30 since 1913. The increase of natal deaths is attributed to the diminishing birth rate, producing an increasing proportion of first births, and probably increasing the age of primiparae.

It has been proposed that infantile mortality rates be recorded in more detail, as follows: (1) Deaths of infants under 1 year per 1,000 live births; (2) Deaths from 1 to 12 months per 1,000 live births; (3) Deaths of infants under 1 year per 1,000 live births; (4) Stillbirths per 1,000 total births; (5) Deaths under 1 month together with stillbirths per 1,000 total births.

There are three groups of causes of early death, non-viability and disease of the embryo, damage by the process of birth, and post-birth disease. The first may cause death from the time of conception to the end of the first month of extra-uterine life; the second, during birth or within the first week of separate existence; the third, from the end of the first week onwards. Congenital syphilis is a cause of death, but recent research shows it to be less prevalent than is generally believed. Toxemia is assumed from the latest research to be a disease of the embryo, but it is for clinical purposes a maternal disease.—*Med. Off.*, 40: 11 (July 14), 1928.

Endemic Goiter in Massachusetts—In the fall and winter of 1925–1926, the Massachusetts Department of Public Health in coöperation with the U. S. Public Health Service conducted a goiter survey in 55 towns and cities of Massachusetts. There were 12,270 students examined for goiter. Seventeen and six-tenths per cent were found goitrous. The goiter rate among children whose parents were born in Russia is higher than for children of other parents. Tabulations show that there is no dif-

ference between the goiter group and the non-goiter group with respect to height, and only a slight difference in weight. The mean weight for children with goiter is slightly less than for those without. The presence or absence of communicable diseases such as chicken pox, measles, mumps, whooping cough, scarlet fever, poliomyelitis, rheumatism, convulsions and diphtheria, or the presence of enlarged tonsils, adenoids, cervical glands and dental caries, has no apparent effect on goiter incidence. Fifteen and seven-tenths per cent of the children with goiter, and 13.1 per cent of the children without had poor posture.

There were 39 places with information regarding iodine content of drinking water and goiter incidence. The correlation was not large, but consistent with the impression that lack of iodine content in water is to some extent responsible for development of goiter.—Carl R. Doering, Herbert L. Lombard and Fredrika Moore, *New Eng. J. Med.*, 199: 143–145 (July 19), 1928.

Vital Statistics of Germany in 1926—A report of the federal health bureau on the vital statistics of Germany for the year 1926 shows that the decline in the birth rate has continued on into 1927 and has led to the lowest rates ever recorded. Nor is the decrease in birth rate confined to the large cities, as is commonly assumed, but it is a manifestation under which also the rural districts are beginning to suffer to an alarming extent. In communes with 15,000 and more inhabitants, the number of legitimate living births in 1926 was only 13.3 per 1,000 inhabitants, so that for each marriage of that year there were only 1.6 living births, whereas the proportion for the whole reich in 1925 was 2.4, and in 1900 was about 4. The infant mortality, on the other hand, has been reduced. With a mortality of 10.1 per 100 living births, the death rate for 1926 reached the lowest recorded

level. The mortality rate, on the average, for the decade 1901–1910 was 18.1 per 100 living births. Also the mortality of young children aged 1 to 5 was further reduced, one of the lowest death rates for that period of life in Europe being attained. In a comparison of the death rates of the cities and the rural districts, it appears that the large cities have the lowest infant mortality, whereas the mortality of children over 1 year of age is distinctly higher in the cities than in the small communes.

There was a marked decrease of tuberculosis mortality. The figure is only slightly higher than the minimum tuberculosis mortality for Europe, as recorded in Denmark and in England. Conditions are much less favorable with regard to scarlet fever; the number of cases and also the mortality show in 1926 a still further increase. Measles has abated greatly; diphtheria has retrogressed somewhat, while whooping cough presents an almost unchanged incidence. There was a notable increase in the number of cases of infantile paralysis—from 1,200 up to 1,614. Influenza showed a slight increase in the case morbidity, though, in the main, it is taking on again the character of a disease claiming its victims almost exclusively among the very young and very old, its manifestations being now much the same as before the war. Also the number of suicides, especially in the smaller communities, shows an increase.—*J. A. M. A.*, 91: 188 (July 21), 1928.

Poliomyelitis Work in Vermont—The 1927 Yearly Report of the After Care Division of Poliomyelitis shows that 954 patients were under supervision. Poliomyelitis cases when reported to the Department of Health are followed up first by the research worker, and then by after care nurses.

There were 183 new admissions and 878 clinical examinations made during the year. The charts show that the

number of patients under supervision has doubled since 1920, and that the number of patients seen during the year has almost tripled.

There were 40 new cases of poliomyelitis for the year. Thirty-five of these were seen. Thirty-one needed after care treatment, 2 were abortive, 1 was a practical recovery and 1 died. Of the 5 cases not seen, 1 was abortive, 2 were practical recoveries, and 2 died. The muscle involvement was high and the paralysis severe for the year. In the group of 31 cases under supervision there were 32 paralyzed legs. Twenty-four arms and shoulders were paralyzed, 5 of which were also practically flail, and showed little sign of recovery. Sixteen patients had considerable trunk paralysis.

Where recommended treatment was followed, patients, with the exception of those with completely paralyzed muscles, showed improvement in muscle strength. Even in the most severe cases deformities due to contractions had not developed. Craft work is taught to many of the patients, and it is reported that 3 have learned a craft that they can make and market themselves.—Charles F. Dalton, *New England J. Med.*, 198: 755-758 (May 24), 1928.

Epidemiology of Diphtheria—New-born infants of Schick-negative mothers are found to be Schick-negative, but at 9 to 12 months of age 90 per cent of infants are Schick-positive. The proportion found naturally Schick-negative increases progressively with age. The proportion of Schick-negatives is generally higher in urban than in rural populations, and higher for children in institutions and congested districts than in less crowded areas. Ap-

proximately 95 per cent of the institutional children between the ages of 10 and 14 in New York City were found to be Schick-negative, whereas only 72 per cent of the school children were negative.

In Auburn, N. Y., about 41 per cent showed negative tests; and in rural Vermont only 22 per cent of the school children were negative.

From 1922 to 1925, 9,000 white children under the age of 15 residing in six wards of Baltimore were Schick-tested. About 68 per cent were Schick-negative when they reached the age of 15; 52 per cent at the age of 10; and 21.5 per cent at the age of 5. About 12 per cent of the children aged 15 had had a previous attack of diphtheria. There is an average immunization rate of 6.1 per cent per annum in the second 5 years of life.

In white children the ratio of disease to bacteriologically demonstrable infection seems to vary according to the circumstances of exposure. In families in which a case of clinical diphtheria has occurred, it was found in Baltimore that of family contacts aged 5 to 14 (exclusive of those who have received prophylactic injections of antitoxin), 4.33 per cent develop diphtheria within 30 days following the onset of the primary case. Of the contacts aged 5 to 14, 24.6 per cent become carriers of virulent bacilli without developing the disease. Therefore, among the children of this age exposed to infection by living in the house with a case of diphtheria, the ratio of carrier infection to clinical diphtheria is 6 to 1, whereas it has been found that in children exposed at school the ratio is 47 to 1.—W. H. Frost, *Infection, Immunity and Disease in the Epidemiology of Diphtheria. J. Prev. Med.*, 2: 325-343 (July), 1928.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

Report of Proceedings Eighth Annual Conference International Association of Street Sanitation Officials—As a part of the report of a committee to study costs and methods of various garbage disposal systems, there are included answers to circularized letters of inquiry which were mailed to about 200 cities in the United States. Tabulations are given showing pertinent facts relating to the methods of garbage collection and disposal now employed in these cities. It is stated that the essential features of an efficient garbage collection and disposal system include: (1) sanitation, (2) service, (3) economy, (4) dependability and flexibility, and (5) expediency. Various garbage disposal methods discussed include dumping, reduction, incineration, burial and plowing in and the Beccari process. This article is an excellent summary of the methods now employed in many of our larger cities. Jan., 1928, pp. 43-54. Abstr. W. L. Havens.

Treatment of Packing Plant Wastes—A description is given of the activated sludge plant operated by the Iowa State College Engineering Experiment Station at the packing works of J. E. Decker & Son, Mason, Ia., with an outline of operating experiences. The plant consists of a Dorco rotary screen, primary settling tank, two aeration tanks, secondary settling tank and a sludge re-aeration tank. Both settling tanks are of the Dorr type, equipped with thickeners. The average hourly flow varied from 200 to 490 g.p.m., dropping to 125 g.p.m. on Sundays. During periods of low flow, difficulties were experienced due to the primary settling tanks becoming septic, this condition giving rise

to disturbances in the purification process. With a sludge return of 50 g.p.m., the theoretical detention period in the sludge re-aeration tank is $5\frac{1}{2}$ hours. This tank, which was installed after the plant had been in operation some time, has effected a great improvement. The short period of aeration has little effect, however, when the sludge is septic. Increasing sludge return to 150 g.p.m. by returning sludge directly to the aeration tank during low flow periods has been found to facilitate the building up of a large amount of sludge for use when the flow increases.

One of the most troublesome factors encountered has been the rising of sludge in the final settling tank. This occurs when the sludge is under- or over-aerated, or slightly septic. Applying a continuous spray of water to the scum formed has been partially successful in causing the sludge to re-settle. Carefully controlling the air supply is the best method of combating this condition.

On some days extreme foaming has occurred in the aeration tanks, the foam at times covering the tanks to a depth of 6 ft. and the ground to a depth of 1 to 4 ft. for a distance of 50 ft. Foaming apparently occurs at certain intervals when the tanks are changing from an under-aerated to a fully aerated condition. Probably the most effective remedy would be either the use of oil in the tanks or the application of a flat, horizontal spray of water which would tend to cut the foam.

To correct unequal distribution of air the tanks were dewatered and cleaned. A heavy deposit of sand and organic matter was found on the entire bottom of the aeration tanks to a depth of 4-6 inches. The filter plates were cleaned

by scrubbing, soaking in hydrochloric acid (sp.gr. 1.14) and finally washing with hot water applied through a nozzle under pressure. The method employed for testing the loss-of-head through the plates before replacing them is outlined.

Experiments have been carried out on dewatering the sludge with an American Continuous Filter. The primary sludge, which contains 6 per cent dry solids when treated with 10 lbs. of alum per 1,000 gals., filters readily to 71 per cent moisture. A few determinations have indicated an erratic solid content in the activated sludge varying from 0.25 to 1.5 per cent. A mixture of 75 per cent activated and 25 per cent primary sludge treated with 5 lbs. alum per 1,000 gals. gave a cake with 75 per cent moisture or a little higher. A few tests with ferric chloride also gave good results, but the moisture content of the cake was somewhat higher. The mixture of sludges filters more rapidly than the primary sludge alone. It is not expected that the plant will be able to treat successfully the wastes during the approaching peak killing season.—Frederick G. Nelson, *Canad. Eng.*, 53, 25: 627 (Dec.), 1927. Abstr. R. E. Thompson.

Industrial Waste Research Problem in Southern California—Southern California has about 5,000 industries, many of which have serious difficulties in disposing of liquid wastes. No streams are available for dilution, and inland towns will be dependent on high grade treatment with disposal on land or in dry stream beds.

Research in industrial wastes is a logical extension of research in sewage disposal. Factors of temperature, staleness of sewage reaching plants due to low grades or long travel, and variable quality of sewage constituents due to high fruit and vegetable diets, all tend to make the problem of sewage disposal different from that in the East. The

industrial wastes are also different, and separate study must be made of each kind of waste.

The only practical solution of the problem seems to be to have a research organization either as a part of the Department of Public Health, the Department of Natural Resources, or some other state department. Private engineers cannot afford to carry on this kind of research; industries will not carry it on unless forced to do so; salesmen can only try out their equipment, which is not likely to bring about fundamental solutions; student theses are not sufficiently prolonged to allow a complete solution; and the various organizations now working intermittently are not equipped adequately to handle the work.—R. F. Goudey, *Western Construction News*, 3, 1: 18 (Jan.), 1928. Abstr. E. A. Reinke.

Relation of Turbidity to Coagulant Dosage—In this paper is described the relation of the turbidity to the coagulant dosage as observed at the Omaha, Neb., filtration plant. From a series of tests by permitting river water to settle in a 5½-ft. glass cylinder for various lengths of time and then siphoning off samples for turbidity tests, it was found that the coagulants required could be determined by the results of the 3-hour settling tests.

During periods of high turbidity (10,000 p.p.m.) the application of coagulants at two points has been extremely helpful in delivering a satisfactory water to the filters. The effect of various turbidities on the coagulants required, also the results of the settling tests, are given in detail and shown on various charts of operation for June and July, 1926, and May, 1927.

The following conclusions are given: (1) The suspended material is chiefly responsible for variation in coagulant dosage; (2) coagulant dosage can be determined largely by the results of the 3-

hour turbidity test; (3) two-point application of chemicals is helpful in treating very turbid water; (4) the 24-hour turbidity test gives a good indication of the concentration of finely divided material, some of which is of colloidal nature.—Kenneth C. Armstrong, *Am. City*, 38, 2: 100 (Feb.), 1928. Abstr. J. B. Harrington.

Water Pollution Control, Milk Products Wastes—This bulletin presents a compilation of several important findings on the treatment and purification of milk products wastes. Investigations conducted in Massachusetts, Wisconsin, New Jersey, New York, Ohio, Iowa, and by the U. S. Public Health Service are noted with a brief discussion of the results found.

The experiments conducted at the Michigan State College in coöperation with the health department are discussed in more detail. Preliminary laboratory experiments indicate that in using the chemical precipitation method a good floc is secured and efficient settling occurs when sufficient quantities of ferrous sulphate and caustic soda are used. At least 0.6 p.p.m. of ferrous sulphate must be used or the precipitate will be red in color. Lime or caustic soda in quantities sufficient to produce a pH of 7.5 to 8.0 will give a good floc with good settling, but produces a large amount of sludge. Broad irrigation of milk products wastes is recommended as a temporary expedient where possible.—E. F. Eldridge, J. M. Hepler and H. S. Murphy, Department of Health and Department of Conservation, Michigan, June, 1927. Pamphlet 15 pp. Abstr. D. W. Evans.

Digestion of Vegetable Wastes and Screenings in Sewage Treatment Plants—Comprehensive researches in the digestion of mixtures of garbage, screenings, fresh sewage solids and digested sludge were made to ascer-

tain whether garbage could be digested with the sludge at sewage disposal plants. Studies in the digestion of vegetable wastes from canneries will be made in the future. It was found that mixtures of vegetable wastes and fresh sewage solids digested very slowly; that the addition of ripe sludge greatly hastened digestion; and that lime dosing still further hastened digestion. The rate of digestion of vegetable wastes and screenings is slow due to production of acids, which inhibit growth of putrefactive organisms. The addition of lime neutralizes acidity; the addition of ripe sludge seeds the mixture; and the addition of fresh sewage solids provides the nitrogenous wastes necessary for normal digestion. It was concluded that vegetable wastes and screenings may be digested in sewage tanks provided the sludge capacity is adequate and provided the ratio of sewage solids to vegetable wastes (nitrogen to carbon) is large. The allowable ratios in practice will be determined by further studies.—W. Rudolfs and H. Heukelekian, *Water Works*, 67, 3: 113 (Mar.), 1928. Abstr. C. R. Cox.

Seeding New Tanks—The difficulty sometimes experienced in starting the operation of a new tank was deemed of sufficient importance to warrant laboratory experiments in order to determine what could be substituted for ripe sludge when the latter was not available. Definite quantities of fresh solids were mixed with ripe sludge, horse manure, cow manure and muck from a creek and results compared with fresh solids seeded with ripe Imhoff sludge. It was found that neither manure nor muck is so effective for seeding as ripe sludge. Muck was about half as good as ripe sludge and horse and cow manure still less. If sludge from a polluted stream is available for seeding it is to be favored. Seeding with horse manure and additions of lime are beneficial but

still inferior to seeding with ripe sludge. Addition of lime to fresh solids when ripe sludge is present for seeding keeps floating solids down.—William Rudolfs, *Report of the Department of Sewage Disposal of the N. J. Agriculture Experiment Station for year ending June 30, 1927*, pp. 284–94. Abstr. W. L. Havens.

Milk Supply—In the May issue of this JOURNAL there appeared the Report of the Committee on Milk Supply as presented to the Public Health Engineering Section at the last Annual Meeting.

The first part of the report relates to the standardization of equipment of rooms in which milk is handled. This leads into the methods of cleaning and handling apparatus; the definition of pasteurization with methods for operating pasteurizers, and several other questions.

The clear-cut style in which the report is prepared makes it easily understood. The complete report is worthy of study by all sanitarians.

Tadpole of the Spadefoot Toad an Enemy of Mosquito Larvae—Tadpoles of most toads and frogs are herbivorous and live in entire harmony with mosquito larvae. The tadpole of the spadefoot toad seems to be “de-

parting from the traditions of its ancestors and relatives and adjusting itself to a new type of diet.” The larger tadpoles of the spadefoot seem to live on a strictly carnivorous diet, the structure of the mouth being adapted for seizing and holding the prey, and are active and efficient enemies of mosquito larvae, as proved by certain laboratory and field experiments recorded in the article.

The toad has the advantage over fish in being able to travel overland to new habitats after the fish have been killed by previous drying-up of the water.

The season of the spadefoot toad is usually short and limited to early summer. This is a marked disadvantage as an enemy of anopheles, as well as other mosquito larvae. Its range is western and it is to be proved whether it might be possible and worth while to colonize it in other regions.

On the whole, no such antilarval efficiency can be expected of this tadpole as is exhibited by certain larvivorous fish; but its propagation, if such is practicable, could not interfere with any other enemy of mosquito larvae, and the more abundant and the greater the variety of natural enemies of mosquito larvae the better. The spadefoot would probably find its greatest usefulness in localities where there is extensive breeding of mosquitoes in shallow, temporary waters.—

M. A. Barber and C. H. King, *Pub. Health Rep., Reprint No. 1200*, Dec., 1927. Abstr. C. H. Kibbey.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

Intoxication with Commercial Methyl Chloride—The introduction of household refrigeration machines in which methyl chloride is used as a refrigerant has served to bring about a number of cases of poisoning with this substance in manufacturing plants engaged in making these refrigerants. Dr. Baker found that the gas is absorbed in amounts sufficient to produce intoxication unless precautions are exercised against this. The symptoms range from vertigo, staggering gait, sleepiness to nausea, anorexia and loss of weight. The detection of methyl chloride in the urine as ammonium formate prior to the development of symptoms of intoxication is suggested as a possible method for the control of the industrial disease.—H. N. Baker, *J. A. M. A.*, 88, 15: 1137 (Apr. 9), 1927. L. G.

Trend of Disabling Sickness among Employees of a Public Utility—The morbidity statistics of a large public utility situated in Massachusetts covering the period 1917–1927 were analyzed, with respect to the cause of disability, under five main groupings: industrial accidents, nonindustrial accidents, diseases of the respiratory system, diseases of the digestive system, and all other diseases.

The most important findings which these studies disclosed were the following: Disabling industrial accidents among the male employees showed a downward trend; on the other hand, diseases of the respiratory and of the digestive systems, which together caused nearly 70 per cent of the disability, exhibited a stationary trend. The author points out that the experience of this group should not be considered as typi-

cal or representative of the whole of the industrial population of the country, since the sample is rather small. The data, nevertheless, are of much value in casting light on the problem of sickness in industry.

The author further points out that in order to be productive of results preventive measures will have to be exceedingly definite in their application. In his opinion money and effort will be wasted if spent "on general principles." The common cold and indigestion as causes of industrial absenteeism are of paramount importance.—Dean K. Brundage, *Pub. Health Rep.*, 43, 30: 1957–1984 (July 27), 1928. L. G.

Benzol Poisoning as a Possible Hazard in Chemical Laboratories—The writer of this paper calls attention to the fact that benzol is often used in chemical laboratories in the making of certain tests and in the cleaning of glassware. Studies made in certain laboratories where benzol was used for these purposes indicated that while a lowering of the number of white blood cells (generally used as one of the indications of benzol poisoning) was not in evidence, the change in the percentage composition of various white blood cells was apparent on examination of the exposed persons. For this reason the author calls attention to the fact that benzol may constitute a real hazard in chemical laboratories.

The amount of benzol used in the average chemical laboratory for the purposes mentioned is so small that a more expensive solvent might be substituted without any real increase in upkeep of the laboratory. It should be possible to substitute some less toxic solvent, such

as toluol, xylol, or naphtha, such as recommended by the National Safety Council in its studies made on benzol poisoning.

In conclusion, it is recommended that all laboratory workers exposed to benzol fumes be given a thorough medical examination every month or two.—J. J. Bloomfield, *Pub. Health Rep.*, 43, 29: 1895–1897 (July 20), 1928. L. G.

Skin Eruptions in Industry—Dr. Mayers is of the opinion that there are few substances, no matter how innocuous to the average individual, which could not cause severe dermatitis in persons having a particular idiosyncrasy to them, citing the case of poisoning of a worker who was engaged in a factory wherein scented face powder was manufactured. The face powder apparently was used by thousands of consumers in the United States without ill effect, and yet this worker, apparently sensitive to some of the flower extracts in the powder, fell ill with a severe dermatitis.

In conclusion, Dr. Mayers points out that cases of dermatitis are at the present time regarded as occupational diseases and are covered by the law of the State of New York relating to these diseases.—May R. Mayers, *Indust. Hyg. Bull.*, V, 2: 5 (Aug.), 1928. L. G.

Atmospheric Smoke Pollution and Its Relation to Public Health—Many of us today are inclined to believe that the smoke problem was the product of intensive urbanization of the last few years. Such, however, is not the case. In this interesting contribution, Mr. Bloomfield points out that early in the 14th century a royal proclamation was issued in England prohibiting the use of sea coal in the furnaces of metal workers, and it is even recorded that one man who disobeyed the King's edict was executed in London for this crime.

Smoke has two effects upon health, the direct effect produced by the inhalation of this material into the lungs of the exposed persons, and the indirect effect, namely, the obliteration of sunshine and its health-giving rays. The author points out that city air is polluted by soot from burning coal, by gases, and lastly by dust from the ordinary occupations taking place in the city. The two most important gases present in city atmosphere are carbon monoxide and sulphur dioxide, and it is fair to say that under ordinary circumstances both of these are present in such small concentrations that they may be considered harmless so far as the average city dweller is concerned.

The present paper contains one of the most rational discussions on the effect of soot on the health of city dwellers with which the reviewer is familiar. To one versed in the methods of scientific inquiry it must be apparent that the proof of a question of this type is exceedingly difficult. Mr. Bloomfield's paper shows that the data and statistics so far brought forward do not permit one to arrive at a definite conclusion on this point. There is no doubt that soot is annoying, discomforting, and unesthetic, but the proof that it is actually harmful still remains to be forthcoming.

The indirect effects of smoke are really of enormous importance, but here, once again, the proof is wanting, and for the time being, while we all are cognizant of the fact that smoke shuts off a certain proportion of sunshine and ultra-violet light, it still remains to be proved that this effect is sufficient to be called injurious to health.

The solution of the problem of smoke pollution depends on the coöperation of the mechanical engineer, the fuel engineer, and the public, according to this paper.—J. J. Bloomfield, *J. Outdoor Life*, XXV, 8: 457–462 (Aug.), 1928. L. G.

FOODS, DRUGS AND NUTRITION

WALTER S. FRISBIE

The Septic Sore Throat Outbreak at Lee, Mass.—The epidemic of septic sore throat at Lee, Mass., which resulted in 600 cases with 36 deaths, has been officially traced to infected raw milk. Cultures of hemolytic streptococci were obtained from one of the cows and from a number of milk handlers. The first case was reported July 1 and terminated after the enforcement of a local ordinance of July 7 requiring all milk to be pasteurized. Dr. Bigelow, Health Commissioner of Massachusetts, feels certain that, as a result, the milk supply of the Berkshires is adequately supervised, and points to the moral that "raw milk is a very potent vehicle for the transmission of disease."—*Pub. Health Rep.*, 43: 2112 (Aug. 10), 1928.

La Cuisson sous Pression des Aliments (Cooking Food under Pressure)—In order to determine whether a short pressure cooking of 120° C. would be equivalent to a cooking for several hours at 100° C. in ordinary vessels, this experiment was undertaken: Two vessels exactly alike were employed, one using the ordinary method, and the other in a commercial pressure autoclave. Analyses of the products of the resultant cooks were made, paying particular attention to the distribution of nitrogen, since this permits a method of determining the degree of proteolysis. This comparative experiment was conducted with soup composed of meat, bone, vegetables and the usual condiments. Analytical figures are submitted showing the content of the material prepared by both methods—dry extract, nitrogenous material, fat material, reducible and saccharin matters, other carbohydrates, and fixed min-

erals. Analytical data are also submitted of the meat, both in the fresh state and after cooking, including determination of the total soluble nitrogen, residual nitrogen, alpha amino nitrogen, and ammoniacal nitrogen. These figures indicate: (1) that the degree of proteolysis of fresh meat is relatively increased; (2) in the soup cooked in the autoclave as well as that prepared by ordinary methods the ammoniacal nitrogen contained in comparison with the total soluble nitrogen is less than in the fresh meat.

The results respectively reported for the two methods show that the soluble nitrogen prepared by autoclave is richer in amino acids than that obtained by ordinary cooking and that it contains a quantity of ammoniacal nitrogen greater than that provided in the meat. The transformation of amino nitrogen into ammoniacal nitrogen takes place in artificial hydrolysis as well as in the natural proteolytic decomposition. It appears to take place in proportion to the increase in splitting of nitrogenous material, and under certain conditions with a rapidity equal to that in the decomposition of proteins into amino acids. From a nutritional viewpoint the production of ammonia has little importance, for even if it has not been shown up to the present that the element is harmful, it is of no particular value to the system.

In conclusion, since soup prepared in the pressure cooker contains less nitrogenous material, fat, reducible matters and dry extract than the ordinary soup, it might be said that it is less nutritive than the latter. On the contrary, the meat is better when cooked under pressure. It is contended that the pro-

cedure has advantages and some disadvantages which approximately equalize. From the economic standpoint the pressure cooker is preferable since it consumes less than one-quarter the amount of gas of ordinary cooking.—M. J. Froidevaux, *Annales des Falsif.*, 234: 252 (June), 1928.

The Effect of Large Amounts of Pineapple Juice—Recent arrivals in the Hawaiian Islands complain of discomfort after the ingestion of large amounts of fresh pineapple, which is relieved by discontinuing the pineapple and administering sodium bicarbonate. Since pineapple is regarded as potentially alkaline, and in the belief that it would not cause acidosis, four healthy women were the subject of a digestion experiment to determine the effect of this juice on the urine. After a short time on a basal diet consisting of milk, crackers, egg, apple, and butter, 1 quart of pineapple juice was added for two consecutive days, and on the third day $1\frac{1}{2}$ quarts in one subject and $1\frac{1}{4}$ quarts in another. In a subsequent experiment the basal diet was supplemented by the addition of white potato. Results reported on the urine include, total volume, pH value, titratable acidity with N/10 NaOH, and ammonia. These show that large amounts of fresh pineapple juice result in lower acidity both as indicated by the pH value and by titration and a decrease in ammonia output. These results would be expected according to the report that citric acid constitutes 87 per cent of the non-volatile acid in pineapple juice. The explanation of the apparent acidosis is attributed to the presence of calcium oxalate crystals in the juice. The fact that cooked pineapple is less irritating was explained by the activity of the crystals and the fact that the proteolytic enzyme, bromelin, is destroyed in canning.—Carey D. Miller, *J. Home Econ.*, 20: 498 (July), 1928.

Effect of Pasteurization on the Bovine Tubercle Bacillus in Naturally Infected Tuberculous Milk—In conducting the experiments reported in this article the author used naturally infected milk from three tubercular cows in order to overcome certain objections to the use of milk inoculated with cultures of tubercle bacilli, namely, that artificial cultivation yields organisms which are less resistant to outside influences than those occurring naturally, and that cultures of bacilli can have no such protective covering as is provided by cells and tissue in natural infection. Four series of experiments were conducted in which the milk was heated at (1) 62.8° C. (145° F.) for 30 minutes, (2) 60° C. (140° F.) for 30 minutes, (3) 60° C. (140° F.) for 20 minutes, and (4) 59.3° C. (138.8° F.) for 20 minutes. Guinea pigs were inoculated with the centrifugalized deposit and the cream of the heated milk, as well as with coagulated material from the cooler. In the first series 1 guinea pig, out of 118 inoculated, developed tuberculosis. In the second series, out of 100 guinea pigs inoculated, none developed tuberculosis. In the third series 1 guinea pig, out of 66 inoculated, died of tuberculosis. In the fourth series, 10 out of 12 inoculated guinea pigs developed tuberculosis. In each of the first and third series 1 guinea pig died from tuberculosis following inoculation with coagulated material from the cooler. In the third series both positive cases occurred near the end of the lactation period when the milk was abnormal.

It is pointed out that standardized thermometers must be used in commercial pasteurization but that with all precaution it is by no means always possible to exercise the strict control which obtains in the laboratory. The author concludes that temperature of 62.8° C. (145° F.) for 30 minutes does not invariably kill the tubercle bacillus in naturally infected milk, although in

most cases this temperature is effective, and that at a temperature of 60° C. (140° F.) for 20 minutes tubercle bacilli are in many cases destroyed; but this combination of time and temperature leaves no margin of safety.—L. J. Meanwell, *Brit. J. Hyg.*, 26: 392 (Oct.), 1927.

Biological Values of Certain Types of Sea Foods. III—Vitamins in Clams—The work reported was conducted similarly to experiments on oysters which were shown to be a good source of vitamins A, B, and D, but deficient in E (see abstract, this JOURNAL, Mar., 1928, p. 374). Two commercial varieties of clams were used, *Mya arenaria* or "soft-shell clam" and the *Venus mercenaria* or "quahaugs," the former obtained from the Maine coast and the latter from the lower Potomac River. Raw, frozen, hard-shell clams, fed to 50-gm. rats in 2-gm. and 5-gm. daily doses, resulted in all cases in a decline in weight, polyneuritis and death. Similar results followed the ingestion of frozen, cooked quahaugs and desiccated quahaugs. Prophylactic tests using soft-shell clams in the 5-gm. level also indicated evidence of appreciable amounts of vitamin B, which in this work refers to the vitamin B complex without reference to its separate factors.

In attempting to cure experimental xerophthalmia, quahaugs were fed at 4 levels, 1, 2, 3.5 and 5 gm. Five gm. cured xerophthalmia completely but did not prevent slight reoccurrences. With the soft-shell clams, daily doses of 3.5 gm. rapidly improved the xerophthalmic rats, the 5-gm. level being adequate for a cure and indicating some superiority in vitamin A in the soft-shell clam over the hard-shell clam. Vitamin D was determined by the line test method. Five gm. of hard-shell clams resulted in 10 days in half calcification and in 15 days in almost complete calcification of

the rachitic metaphases. Similar results were obtained with the soft-shell clams, which compared with the oysters indicated clams to be superior as a source of vitamin D. As a confirmation, the ash of clams was fed in doses equivalent to 5 gm. fresh clams and the calcifying effect in 10, 15 and 20 days was practically negligible, warranting the conclusion that the antirachitic activity is due to vitamin D and not to superimposed phosphorus. Dried, cooked hard-shell clam meats were fed as a meal to determine the reproduction and lactation factors. This experiment was conducted through two generations, in both of which the rate of growth was satisfactory. Better results were obtained in the second generation rats, in which 82 per cent of the young were reared, as against 61 per cent in the first generation. On the same basal diet with oysters only 14 per cent of the young were reared and in the second generation none was reared, warranting the conclusion that clams are superior to oysters in the reproduction and lactation factors.—D. Breese Jones, E. M. Nelson and J. C. Murphy, *Indust. & Eng. Chem.*, 20: 648 (June), 1928.

The Possibility of Producing Iodized Milk—Although figures for the iodine content of milk are given by various investigators, Forbes and others at the Ohio Experiment Station do not find iodine in milk of cows fed at the station. Milk from cows on a variety of rations and at different stages of lactation has been analyzed. In order to determine if the feeding of iodine to cows would increase the iodine content of the milk, certain cows were given potassium iodide fed in minimum amounts in order to avoid possible deleterious effects. Four cows for one complete lactation period received 0.1 gm. daily of potassium iodide equivalent to 0.08 gm. (1.2 gr.) of iodine. Six other cows received potassium iodide for varying lengths of

time. Iodine was found in the milk of these cows in amounts from 1 part in 100 million to 1 part in 10 million. This is only a very small part of the iodine fed, indicating that there is some mechanism influencing the secretion in the milk. Tests were made on 6 cows in a commercial herd near Columbus, 2 receiving no iodine, 2 receiving 2 oz. of dulce, one receiving 2 gr. of calcium iodide and the other 2 gr. of potassium iodide per day. No iodine was found in the milk before experimental feeding. After feeding for 30 days, milk from the check cows showed no iodine while milk from 4 other cows showed iodine from 1 part in 10 million to 1 part in 100 million. The iodized milk as the result of iodine fed is not richer in iodine than milk produced in sections where feeds are naturally rich in this element. Milk with an extremely low iodine content is regarded as being equally abnormal as one with a high iodine content.—C. P. Monroe, *Ohio Agri. Exp. Station Bulletin*, 13: 153 (July-Aug.), 1928.

The Relative Stability of Vitamin A from Plant Sources—Recent reports of the stability of vitamin A in butterfat and cod liver oil have prompted this investigation as to the comparative stability of this vitamin from vegetable sources. The foods to be tested were given to 28-day-old rats which had been reduced to vitamin A depletion by a special diet. Canned tomato juice filtered through cheese

cloth was freed from oxygen by the introduction of nitrogen gas, and it was found that 7 c.c. of this juice after heating 4 hours in a flask at $97^{\circ} \pm 2^{\circ}$ were required to produce the same gain in weight as 5.8 c.c. unheated juice in daily doses. When the juice was heated to the same temperature in the presence of oxygen 7 c.c. was found to be equivalent to 5.8 c.c. unheated juice. Both tests were conducted with tomato juice of normal acidity pH about 4.82. The effect of heated tomato juice in an alkaline medium was undertaken, the filtered juice being brought to a pH of 9.2 with NaOH and heated 4 hours at $98^{\circ} \pm 2^{\circ}$ in the presence of nitrogen. After reducing the heated juice with hydrochloric acid to the normal acidity, pH 4.2, this was fed in 2 c.c. doses daily.

After 8 weeks the average weight gained was 47 gm. for a juice heated at pH 4.2 and 45 gm. for the alkalinized heated juice, indicating practically no destruction of vitamin A. In comparing the animal and plant sources of this vitamin, dried spinach leaves and butterfat in olive oil solution were respectively heated 4 hours at $97^{\circ} \pm 2^{\circ}$ under anaerobic conditions. About 20 per cent of the vitamin A in spinach and about 33 per cent in butter were destroyed in this heating, indicating vitamin A from this vegetable source to be more stable than that in butter.—H. C. Sherman, E. J. Quinn, P. L. Day, and E. H. Miller, *J. Biol. Chem.*, 78: 293 (July), 1928.

CHILD HYGIENE

MERRILL E. CHAMPION, M. D.

The Prevention of Maternal Mortality—The problem of maternal mortality is one which is attracting the attention of the laity as well as of the medical and nursing professions. It apparently has always been of especial interest to women members of the Labor Party in various countries. As might perhaps be expected, more stress is laid by the laity on "maternity benefits" in the shape of financial and other aid than would be the case with those trained in the science of "public welfare."

In England recently the Standing Joint Committee of Industrial Women's Organizations prepared a report for the National Conference of Labour Women. The recommendations of this committee ought to be of interest to public health and social workers in any country. American readers should, however, bear in mind the English background of Insurance Act and "doles" in any criticism offered of some of the committee's suggestions set forth below:

1. It should be compulsory for every health authority to prepare within a given time, say one year, a complete scheme for maternity work. . . .

2. Such a scheme should include the following:

(a) Sufficient ante-natal clinics to enable all pregnant women to seek advice. . . . We think that these clinics should all be organized and controlled directly by public health authorities, instead of some being under voluntary agencies. . . .

(b) Sufficient maternity beds . . . for all women whose confinements are likely to be difficult or whose home circumstances make confinement at home unsuitable and dangerous. Such provision should not be associated with the Poor Law, and should be free where necessary, with a rising scale of reasonable charges based on income. . . .

(c) National health insurance. We are in

favour of the extension of medical benefit to the wives of all insured persons and the administration of that benefit by the local health authority. This should include medical attendance and nursing care in pregnancy and childbirth free of all additional charge. . . .

(d) Sickness benefit.

(e) Maternity benefit.

(f) The provision of home helps to assist the mother in her housework both before the child's birth and in the period following is essential.

(g) Provision of food. It should be the business of the local authority, on application from its health visitors, clinics, and the doctors and midwives, to make provision for food for mothers in need of it free of cost, and at cost price for those desiring to pay.

(h) There is need for a great reorganization of medical, midwifery, and nursing services.

(i) The Medical Service must work in closest coöperation with the ante-natal clinics and maternity homes and hospitals.

(j) Where the patients are not themselves able to provide the necessary sterilized outfits, these should be provided for the use of doctors or midwives free of cost.

3. We think that there should be an inquiry into every death from puerperal causes.—

The Prevention of Maternal Mortality, Med. Off., 14 (Apr.), 1928.

Child Guidance Clinics—"Child guidance clinics do not include all child guidance work; child guidance is the responsibility of a whole community, not of just one agency." With this sound statement, Stevenson begins his discussion of the problem a community faces in deciding whether or not it ought to have such a clinic.

The first step, the author feels, is to restrict and define the meaning of the term "Child guidance clinic." He would keep it for a clinic "that uses a combination of psychiatric, psychological, and social work technics as applied to the diagnosis and treatment of the

behavior problems of children, for the most part of normal intelligence." Such a clinic has to do with all the children of the community, not merely the dependent ones. Unless the community feels this, it is not ready for a child guidance clinic. Again, the community must not look to such a clinic to "take the troublesome children off its hands." It cannot be done if for no other reason than that of numbers.

"The big job of the clinic," according to Stevenson, "is the education of a community in matters of mental health and the mobilization of its resources to this end." Furthermore, the clinic works largely through other professional groups rather than through parents and children.

A community is not ready for a child guidance clinic until: (a) it has a small intelligent group interested in child guidance work who will educate a still larger group; (b) well-developed social work is available; (c) there are good court facilities for handling the social problems of child and adult.

Finally, suggestions are offered communities unable to have a child guidance *clinic* whereby they may carry out child guidance *activities*. The points enumerated are: trained psychiatric social work; special instruction and classification in the school system under an educational psychologist; provision for local diagnosis and care for the feeble-minded; vocational training classes in the public schools; coördination of school and preschool general medical clinics.—George S. Stevenson, M.D., *When Is a Community Ready for a Child-Guidance Clinic?*—*Mental Hyg.*, July, 1928.

Prenatal Care vs. No Prenatal Care—The study under review was made at the prenatal clinic of the Louisville City Hospital, associated with the obstetrical department of the University of Louisville Medical School, and

covered all cases treated in the obstetrical department of the hospital for a given length of time. All deaths, maternal and fetal, were included, whether from obstetrical causes or not, on the theory that prenatal care is expected "to protect mothers and babies from all danger, medical, surgical or obstetrical, which may arise during the prenatal period."

A general physical examination was given all patients, which included pelvic measurements, blood pressure reading, urinalysis and Wassermann test. Patients came to the clinic at intervals of two weeks for the first seven months, and one week during the last two months of pregnancy.

In recording the deaths, there were included patients practically moribund on admission. Neonatal deaths, that is, those occurring during the first two weeks of life, were also charged up to the obstetrical department in this study.

The results were as follows: There were 3,217 mothers delivered during a period of something over 4 years. Of these, 2,061 had one or more prenatal visits. The rest—1,156—had received no prenatal care. That is, about two-thirds had and one-third had not prenatal care. The maternal death rate among the prenatal clinic cases was 2.91 per 1,000 deliveries as compared with a rate of 22.4 among mothers not getting prenatal care. As regards fetal deaths, the rate was 7.5 per cent among clinic patients as compared with 22.6 per cent among non-clinic patients.

One other point is of great interest. With respect to "eclampsia," the record was 0.58 per cent cases and no deaths among those attending the prenatal clinic; and 3.02 per cent cases and 8.6 deaths per 1,000 deliveries among the non-clinic patients.—Alice N. Pickett, M.D., *A Study of the Results of Prenatal Care vs. No Prenatal Care*. Read before Kentucky State Medical Association, Oct., 1927 (Reprint).

PUBLIC HEALTH NURSING

MIRIAM AMES, R. N.

Keep This in Mind—Public health nurses attending the Annual Meeting of the American Public Health Association in Chicago, October 15 to 19, will have the privilege of studying at close range the methods used in conducting a nursery school. The Franklin Nursery School, which is established and maintained by the Elizabeth McCormick Memorial Fund in cooperation with the Institute for Juvenile Research, will serve as a model.

Visits to Infant Welfare Stations and the various centers of the Chicago Visiting Nurse Association will also be included in the nurses' program.

Breaking Faith with the Indian—“Breaking Faith with the Indian,” an article in *The New Republic*, calls attention to the conditions in the reservations which cry out for improved public health service, reading in part:

Indian education as a whole can only be called a failure

Indian health is much inferior to that of the whites. The general and infant mortality rates are both very high, though statistics are kept so badly that it is impossible to say just how high they are.

The Indians live under conditions of great overcrowding, with inadequate ventilation and sanitation. It is not even possible to segregate those suffering from communicable diseases.

Many of the Indians live on land so poor that it is hopeless to expect them to make a living from their efforts as farmers, even if the government properly assisted them to do this, which it does not. . . .

The whole Indian service suffers because of the fact that salaries of administrators are too low. It is impossible to get good men more than temporarily for the remuneration offered. This is particularly true of the doctors, nurses and teachers. These low standards may account for the fact that in the treatment of trachoma, for example, no attention is usually paid to modern discoveries as to the relation

of the disease to insufficient diet, but recourse is had to a radical operation. This operation has been performed in many cases when it was unnecessary, including some in which the patient did not have trachoma at all. In one special school for children suffering with trachoma, the normal diet actually includes no milk. Everywhere, there is an insufficiency of milk and of fresh vegetables. . . .

New positions in the field of health, economic advancement, education and social development should be created, and salaries fixed which are high enough to attract competent persons. Public health clinics for the Indians are urgently necessary, particularly in the struggle against the two most prevalent diseases, trachoma and tuberculosis. D. D.

The Interrelations of the Hospital Social Service Departments and the Community Health Association of Boston—One of the fundamental premises of health or social workers in any field is that health, economic security, harmonious relationships with the family and society, balanced living, all are interdependent and indispensable factors in the full free life of the individuals for whom their work exists. In order to consider all these factors in working for the welfare of their clients or patients, the special workers in any one field of social work must and do use the services of other groups. Most particularly do hospital social workers and visiting nurses depend upon each other.

However, in the pressure of work and the intensity with which each group has been developing and changing during the past twenty years, there has been little time for directed effort toward knowing each other's functions or considering the best methods of working together.

With the view of securing a better

working partnership between the hospital social workers and the visiting nurses of the Community Health Association of Boston, a study of their relationship has been made during the first part of this year. The survey was made by Mrs. Hilbert Day, with the assistance of a committee made up of representatives of the two groups. The final report of this survey has recently been printed, and its findings and recommendations are probably sufficiently applicable to other communities so that it may be of interest to readers of this JOURNAL.

The study was conducted by means of interviews, letters and case studies, gathered together over a period of about three months. On the whole, both interviews and case studies have resulted in repeated affirmations of good co-operation between the two groups, and tolerance toward some of the inevitable difficulties. In about 15 per cent, or 168 of the 1,000 case studies, relationships were considered by the nurses to be unsatisfactory for one reason or another, and the social workers made a few general criticisms of the nurses' methods of work. Since each unsatisfactory case represents inefficient service to the family, and is a potential cause of ill feeling which reacts upon future relationships, and since there is every indication that the interdependence of the two groups is to become more important as time goes on, it seemed to the committee wise to try to analyze and, if possible, suggest corrections for the underlying difficulties in these 168 cases.

The causes for unsatisfactory coöperation fell into a few definite groups:

1. Conditions which cannot at present be altered, but which by recognition and understanding can be greatly minimized:
 - A. Insufficient number of hospital social workers
 - B. Unavoidable turnover of nurses on a case

2. Mechanical details which can probably be remedied:

- A. Variations in methods of referring cases, and inadequate information given about cases
 - B. Lack of uniformity as to what cases shall be accepted as social cases by hospital social workers
 - C. Undetermined policy as to responsibility for social follow-up in individual cases
 - D. Difference between the two groups in the "time standard" for action on a case
 - E. Lack of routine methods in Social Service Departments for securing medical information and orders for the use of the nurses
 - F. Poor administration of certain accepted routine procedures
3. Elements not fully perceived or used:
- A. The Community Health Association nurses have an intimate and useful fund of knowledge of family conditions of many patients, due to many illnesses or long contact with the families
 - B. Opportunity for further use of the Community Health Association for group services to patients, as is already done in classes for prenatal patients
 - C. Complementary nature of the professional education of the two professional groups, if rightly utilized

Since the fundamental strength of the relationship of the two organized groups is dependent upon understanding, it is recommended that:

- A. A continued process of education be considered by:
 1. The addition to the training of students in the School for Social Work and the School of Public Health Nursing of a short period of observation in the work of the other group
 2. An exchange of workers between the two groups for short periods of observation
- B. The conference method be used for discussion of problems mentioned above
- C. Case conferences be held to discuss such difficult cases as involve the intensive work of both groups
- D. A social case worker be considered as a consultant on the staff of the Community Health Association.

K. E. P.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

Help on Your Job at Chicago—
The section meetings, the Education-Publicity Headquarters, the contacts with those concerned with public health education *should be of real, definite, practical help in doing more and better work.* And of course you have ideas and information of value to the other fellow.

Professional and Lay Coöperation
—The coöperative promotion of the health examination idea by the Medical Society, County of New York, and the New York Tuberculosis and Health Association in a Joint Campaign is told in a reprint from *The Physical Examiner* of an article by Iago Galdston, M.D. Since the procedure and educational material are available through free copies of the reprint, it is sufficient here to urge every health worker interested in the subject to request a copy from the New York Tuberculosis and Health Association, 244 Madison Ave., New York, N. Y. (See exhibit at Chicago.) 3 cents postage.

"An Important and Worthy Object"—A leader in the field of psychiatry said:

May I add to this statement a conviction that I have for many years maintained, namely, that in efforts to get over what we possess to these others that we should undertake the task not as a task that is beneath us but as one well worthy of our metal. The task of popularization, as it is generally called, is too often conceived to be unworthy of the scientific man, but as Professor Robinson has said, in substance, the getting over of the results of scientific inquiry to the public, or at least to that portion of it who can and who ought to know

about them and use them, is as important and worthy an object of scientific research as the discovery of new scientific facts. In fact it is itself a problem in the realm of methodology and should be so considered. In the past I am sure we have erred very seriously by presenting our material in a way that activated the resistances of our audiences.—

Dr. William A. White, *Psychoanalytic Rev.*, Apr., 1928. (Contributed by Paul Komora of National Committee for Mental Hygiene.)

At Every State Convention—At every state health convention and every state conference of social work there should be enough delegates interested in public health education to call a luncheon conference. One plan: ask each one present to state one question he would like to have answered. Then the group present will select the questions to be taken up at the luncheon. Appoint a small committee to plan another luncheon next year. Please write to Prof. John Sundwall, Lansing, Mich., to state that you will arrange for such a luncheon session this fall or winter.

Never Too Late to Learn—"The long and short of it is that modern psychology has demonstrated that for practical purposes age is only a minor handicap, if any at all, to learning anything you want to learn or need to learn." So says Albert Edward Wiggam in *Good Housekeeping* (Sept., 1928), in "It Is Never Too Late to Learn," a popular discussion of recent studies by Thorndike and others. Our job is twofold: first, to cultivate the *will to learn*, and second, to learn a lot more ourselves about how to teach health to adults.

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to EVART G. ROUTZAHN, 130 East 22d St., New York, N. Y.

Stimulating Advertisements—Numerous advertisements in magazines and elsewhere should suggest types of headings for folders and booklets, and ways of developing practical health education material leading away from the conventional practices of health workers. Examples: "I *just couldn't* afford to be laid up"; "Little adventurers! New, better ways to guide them"; "100 per cent of her pupils gained in weight!"; "So many things you do for them—which will count most in the years to come?" and "Beauty Wins—Beauty Keeps" in *Good Housekeeping*, Sept., 1928.

A Simple, Popular Service—Scales in the City Hall! Why not? Make an event of installing the scales by weighing the mayor and other officials. Then a week or two later extend a formal invitation to all citizens to use the scales, inviting several leading citizens to start the idea. Of course, you will let the newspapers know in advance so that photographs may be taken. Height and weight tables can be displayed near the scales.

EXHIBITS

"Classroom Display Settings," by E. A. Deuch, *Infants' and Children's Dept.*, 323 West Jackson Blvd., Chicago, Ill. Probably *free*. Illustrations and text offer ideas adaptable for window display of child health. The large blackboard in the background gives the health opportunity.

Publishers' Weekly tells of a large grandfather's clock in a book store window. "Although it was regularly wound up and kept time correctly, a sign above the clock informed passersby that 'This is not the right time.' Many people naturally stopped to make sure, and on looking more closely they found a smaller sign at the foot of the clock which read '—to be neglecting your education.'" Change the copy to read

"—to be neglecting your health examination"—or what you will.

"The Retail Grocers' Association of Syracuse has voted to coöperate with the department of health in the grocery store exhibits for the current year. Its coöperation is to express itself: (1) by carrying the exhibits from one store to the next; and (2) by printing a leaflet to accompany each exhibit emphasizing health and nutrition lessons."—*Better Health*, Syracuse Dept. of Health.

A truck in a safety parade carried these legends: "The Chance Taken Is an Accident Maker"; "What Do I Care about Safety? Look Who I Am?" On the truck was a donkey!—*Public Safety*, 108 East Ohio St., Chicago, Ill., Apr., 1928. *Free*.

POPULAR ARTICLES

"Decay of the Teeth Is Found Preventable." *New York Times*, Apr. 1, 1928.

"Feet Made to Fit Shoes or Stockings." *Press Bull.*, University of Wisconsin, Madison, Wis., Aug. 29, 1928. *Free*.

"It's the Timidity," by Ruth F. Wadsworth, M.D. *Collier's Weekly*, July 28, 1928. "Most of the things we can do to attain at least the feeling of being cool most of us are convinced are bad for us." File this for next summer's use.

"Prolonging Life." Editorial, *Sat. Ev. Post*, June 16, 1928.

"Snake's Hips," by Brenda Ueland. *Collier's Weekly*, Mar. 17, 1928. Exercise for fat and lean women. High heels make fat legs.

ANNUAL REPORTS

The annual report of the State Charities Aid Association of New York, "Milestone 55," has 116 large book size pages, reporting in considerable detail on a wide range of activities. But the report largely avoids the appearance of being dull and heavy via good margins,

short paragraphs, sub-heads and type size. A table of contents (no index); arranged in "chapter" form; few statistical tables; extensive staff and committee lists and financial report in the back pages.

If you are studying annual reports ask the local associated charities to see copies of these reports: Hartford C.O.S. (how the cases are classified on page 3), Family Society of Philadelphia (for tabbed-in photographs; and general layout—though it lacks sub-headings); Cleveland A. C. (for picture map showing districts and activities; in copy and plan it is a gem, except type is too small).

Report of Maternity Center Association, 578 Madison Ave., New York, N. Y., illustrates striking use of color in diagram and map.

"Are You Satisfied with the Annual Reports You Receive?" by Marguerite A. Wales, *Public Health Nurse*, Apr., 1928. "The trend in content of reports during the past few years should hearten even the pessimist."

WORDS

"The Importance of Respiratory Diseases as a Cause of Disability among Industrial Workers(!)." A radio talk.

DIPHTHERIA

In a report of the June, 1927, meeting of the Tri-state Medical Conference, are interesting reviews of the participation of state and county medical societies in Pennsylvania, New York and New Jersey. *Atlantic M. J.*, Harrisburg, Aug., 1927. 35 cents.

Dr. D. S. Dooman, health officer and school physician of Garden City, N. Y., having found confusion in the minds of some parents to whom consent slips for toxin-antitoxin were sent, forwarded a questionnaire to the parents of every child in the Garden City schools. The questions covered whether the child had T. A. T. from the family physician or

otherwise, and whether the parents were willing that the inoculations be given at the school. "Within 72 hours we had a record of every child."—The full questionnaire in *Health News*, State Dept. of Health, Albany, N. Y., Dec. 26, 1927. *Free*.

"The best birthday gift to your child is a certificate of protection against diphtheria. Your child should receive Diphtheria Toxin-Antitoxin before his first birthday."—*Sanitary Bull.*, Buffalo Dept. of Health.

Detailed account of Philadelphia's diphtheria campaign, with reproductions of educational publicity material. *Monthly Bull.*, Philadelphia Dept. of Health, July-Aug., 1928.

Application to diphtheria of preventive spraying against insects in a rural community in "Calhoun County Starts Fight on Diphtheria." *Ill. Health News*, State Dept. of Health, June, 1928.

Suggested Curtain-Raiser for the Organization of a Local Campaign. Mimeographed idea for organization meeting. State Committee on Tuberculosis and Public Health, 105 East 22d St., New York, N. Y. *Free*.

Diphtheria Prevention for Preschool Children—A Community Project. As above. *Free*. The New York plan of procedure.

Diphtheria—Its Prevention and Control. By U. S. Public Health Service. 20 pp. *Revised*. Supt. of Documents, Washington, D. C. 5 cents.

NEWS POSSIBILITIES

Check up on the "best sellers" in the health field at book stores, and the "best lenders" at the public library. If the leaders are of the right sort you have a minor newspaper story, and you may glean something as to health questions in which the public is interested. If the wrong books head the list you have data for consideration in planning your year's program.

LAW AND LEGISLATION

JAMES A. TOBEY, LL. B., DR. P. H.

Milk and the Courts—There are on record in this country about 175 decisions of courts of last resort on the subject of milk. In 1924 an endeavor was made for the first time to compile a complete list of these decisions, and 121 reported cases in 32 state and federal courts were assembled by the associate editor, and listed by states at the end of an article on the legal aspects of milk, which appeared in *Public Health Reports* for July 18, 1924. This was later issued by the U. S. Public Health Service as *Reprint No. 939*. Court decisions dealing with pasteurization requirements were discussed in *Public Health Reports* for July 1, 1927, and this article has been published as *Reprint No. 1168*. A paper summarizing court decisions on milk during the year 1927–1928 was read before the meeting of state health officers at St. Paul in June, 1928, and will be published later.

The most complete and useful enumeration of court decisions on all phases of control of milk appeared in *Public Health Reports* for August 10, 1928, in connection with an article on "Regulating the production, handling, and distribution of milk," by Harvey Walker, Acting Secretary of the League of Minnesota Municipalities. Mr. Walker's article consists of a restatement of the legal principles which apply to milk regulation. Appended to this is a comprehensive annotated list of about 150 court decisions, arranged according to topics, of which there are 32. Mr. Walker's list includes the court decisions on milk which have been reported since the earlier article appeared in 1924, as well as a considerable number of others not included there. On the other hand,

the 1924 material cites about 25 decisions not given by Mr. Walker.

The references compiled by Mr. Walker are unusually complete. Not only is the date of each case given, but there are citations to all of the different law reporters in which each decision may be found. The assembling and arrangement of these court decisions is a notable contribution to public health law, one which will be of great value to sanitarians in administrative positions.

Law and the Conservation of Vision—School laws requiring vision tests to be made as part of the medical inspection program or as special tests have been a distinct factor in the effectiveness of work for the conservation of vision, according to the revised edition of a pamphlet entitled "Conserving the Sight of School Children," prepared under the direction of Dr. Thomas D. Wood for the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association. The provisions of the various laws differ greatly, however, and the report accordingly urges the preparation of a uniform model law for the examination of the eyes of school children, which might be adopted in all states. A copy of this valuable pamphlet may be obtained from the National Society for the Prevention of Blindness, New York, N. Y., or through the book service of the A. P. H. A.

Nearly one-half of a group of approximately 2,000 school children examined were found to need glasses, according to a news release issued by the U. S. Public Health Service under date

of September 4, 1928. These results of a typical group may be taken as representing conditions in the general school population of the country, according to the Service.

The adoption and enforcement of laws requiring physicians, midwives, and other attendants at birth to put prophylactic drops in the eyes of babies at birth has resulted in a decline of 64 per cent in the frequency of ophthalmia neonatorum as a cause of blindness among those admitted to schools for the blind, according to a recent news release from the National Society for the Prevention of Blindness.

Protective eyeglasses for industrial workers are described in a pamphlet issued in August by the U. S. Bureau of Standards, Washington, D. C., after, it is said, ten years of research.

Liability of City for Water-borne Typhoid—The courts recognize that the purity of water is of great importance to public health. As was pointed out in this department in the June issue, it now seems to be well-settled law in this country that a municipal corporation, while not an insurer of the purity of water supplied by it, may be, nevertheless, liable for negligence in furnishing water which causes disease. The city must exercise reasonable care to secure and maintain the purity of the water. This doctrine has recently been upheld by the Appellate Division of the Supreme Court of New York, and the July issue of the *Indiana Monthly Bulletin* contains the information that a Circuit Court in that state has recently awarded damages of \$9,000 against the City of Fort Wayne and the Pennsylvania Railroad, because of a death from typhoid due to bad water from the railroad's industrial supply which got into the city water.

The New York case, *Wiesner vs. City of Albany*, 229 N. Y. S. 622, is of interest not merely because it sustains the

legal principle, but also because of the holding with respect to the adequacy of the evidence needed to prove the injury. From a copy of this decision, which has been sent us by B. R. Rickards of the New York State Department of Health, it appears that a 7-year-old child contracted typhoid fever from the city water, which was taken from the highly polluted Hudson River. Tests of this water prior to the development of this case were made by an employe of the State Department of Health, who found colon bacilli, an evidence of human contamination.

Notice of this fact was sent to the city officials, who also knew of the presence of a defective conduit, and were aware of an unusual prevalence of gastrointestinal diseases in the city. "It was a time for prompt and decisive action," said the court in its opinion. "The exercise of vigilance would have led to discovery of the dangerous condition, and reasonable diligence would have provided the remedy."

These events occurred in April. In May there were 83 cases of typhoid of local origin. The plaintiff in this case offered proof pointing to the city water as the cause of the disease and excluding other sources. The city argued that there were other possible sources, but proved none. In its able opinion, the court said:

To insist that the plaintiff must establish that the infection came from the city water by positive proof would be to require an impossibility. It is sufficient if it is shown by the best evidence available that the bacilli were introduced into his system by means of the city water, so that the jury may by reasonable inference reach a conclusion to that effect. This is not speculation, but a process of logical deduction (*Forbes vs. City of Jamestown*, 212 App. Div. 332, 335; s.c. 217 Id. 714). If the plaintiff is able to establish facts from which it can be said with reasonable certainty that the direct cause of the injury was the one for which the defendant was liable, a more stringent rule will not be applied to his case and the jury will be permitted to say that they are satisfied with the proof made, and to de-

determine therefrom the source of infection was the polluted water (*Stubbs vs. City of Rochester*, 226 N. Y. 516, 526).

This case is also abstracted in *Public Health Reports* for August 10, 1928 (page 2114), the same issue containing the court decisions on milk control referred to above. A reprint on the legal liability for water-borne typhoid may be obtained from Wallace & Tiernan Company, Newark, N. J.

A Sanitary Engineering Section at Washington—Effective July 1, 1928, a sanitary engineering section has been organized in the Domestic Quarantine Division of the U. S. Public Health Service, according to a circular letter sent out by the Surgeon General on August 10. This arrangement "will serve to coördinate the engineering activities of the domestic quarantine division and make practicable their detailed supervision by a sanitary engineer of broad experience." One of the immediate effects is the combination of shellfish sanitation work with that of the interstate sanitary districts, the headquarters of which are now at New York, Washington, Chicago, Memphis, and San Francisco.

An article regarding the organization and work of the U. S. Public Health Service, by Surgeon General H. S. Cumming, appears in *The Trained Nurse and Hospital Review* for August, 1928. This same issue has a poignant editorial captioned "A Regrettable Veto," dealing with the Parker Bill as it affects nurses. The disapproval of this excellent measure by President Coolidge is disapproved.

Minnesota's Health Laws—About 100 pages are now required to present the health laws and regulations of Minnesota. A new pamphlet compilation of this legislation, together with ap-

propriate opinions of the attorney general, was issued under date of February 15, 1928, by the Minnesota State Board of Health, of which A. J. Chesley, M.D., is executive officer. This pamphlet, superseding a 1924 edition, is well arranged, well printed, and has an excellent index, always a most important item in such works. If annotations to useful court decisions had been included, this book would have been even more valuable. State health departments which do not do it should issue regularly new editions of their state health laws and regulations.

The Presidency and Public Health—In their speeches of acceptance each of the candidates for election to the Presidency of the United States made brief reference to public health. This is what Herbert C. Hoover had to say, as reported in the *New York Times* for Aug. 12, 1928:

For many years I have been associated with efforts to save life and health for our children. These experiences with millions of children both at home and abroad have left an indelible impression—that the greatness of any nation, its freedom from poverty and crime, its aspirations and ideals, are the direct quotient of the care of its children. Racial progress marches upon the feet of healthy and instructed children. There should be no child in America that is not born and does not live under sound conditions of health. . . .

The remarks by Governor Alfred E. Smith, as given in the *New York Herald Tribune* for Aug. 23, 1928, are as follows:

I shall continue my sympathetic interest in the advancement of progressive legislation for the protection and advancement of working men and women. Promotion of proper care of maternity, infancy and childhood and the encouragement of those scientific activities of the national government which advance the safeguards of public health, are so fundamental as to need no expression from me other than my record as legislator and as Governor.

BOOKS AND REPORTS

The Validity of the Appraisal Form as a Measure of Administrative Health Practice—By Philip S. Platt, C.P.H., Ph.D. New York: American Public Health Assn., 1928. 102 pp. Price, \$1.50.

A well-written, interesting, and carefully and scientifically prepared volume which should be read by all who have any interest in public health administration. It would have been very difficult to find a man better qualified to discuss the *Appraisal Form for City Health Work* than Dr. Platt. His field experience in surveying cities using the Appraisal Form, together with subsequent years of intensive study of the form and its uses, gives authority to the work. [The study was made largely at the instigation of the Committee on Administrative Practice of the American Public Health Association, which committee developed and published the *Appraisal Form for City Health Work*.] It is the only intensive and authoritative work thus far published on the present status of city health appraisal and has been and will continue to be of inestimable value to the Committee on Administrative Practice in discussing the revision of the Appraisal Form.

In addition to an Introduction, in which the author describes the purpose of the study, its characteristics and the collection of data, the volume contains 5 chapters devoted respectively to the Description of the Appraisal Form, Analysis of the Health Activities of the 46 cities, Validation of the Appraisal Form as a Test, Construction of the Abridged Appraisal Form, and Changes in the Appraisal Form.

As the name of the volume implies, to quote the author, "the purpose of the study is to determine whether adminis-

trative health practice as developed today in American cities can be objectively measured in a reliable and valid manner by such a measuring device as the 'Appraisal Form for City Health Work.' "

Before attempting to prove or disprove the reliability of the measure we must clearly understand what it is attempting to measure. The purpose of the Appraisal Form "is primarily to measure the extent of development of administrative health procedures and activities, public and private. It is not a measure of the effectiveness of the activities themselves, nor of the effectiveness of the public health program as a whole. It is not primarily a measure of quality of work *per se*, although indirectly quality of work is measured to a considerable degree."

There is a brief description of the history of the appraisal form idea preceding a full discussion of the development of the present Appraisal Form with its division into 11 major health activities further subdivided into 131 individual items or criteria. The author calls attention to the continual emphasis, on the part of the committee in developing the form, of the necessity of arriving at criteria, standards, and values as the result of group judgment rather than individual opinion. He likewise points out that relative values were finally fixed "from the viewpoint of the relative importance of the criteria in a well-rounded health problem as understood and developed today, not from a consideration of their absolute or potential values in preventing sickness or death."

Following a careful and comprehensive analysis of the surveys of 46 cities, the Appraisal Form as a test is discussed as to its objectivity, reliability

and validity. The general conclusions are that only 6 of the 131 criteria are likely to be sufficiently affected by differences in judgment as to class them as non-objective, that where two or more persons have been engaged in the survey of a city a divergence of opinion as to the scoring of criteria is rare, and that where a city has been re-appraised by a second individual there is a very close correlation between the two appraisals. Taking the 131 criteria and dividing them into two groups, the odd criteria being placed in one group, the even in another, and comparing the scores of each city for the two groups, there is found to be a high correlation which indicates good reliability, in that one-half of the test is practically as good as the other half. The validity of the form is shown by the close correlation which exists between the ranking of cities on the basis of scores obtained, on the one hand, and the opinion of persons having knowledge of the health practices in these cities when both are arranged in order as 1, 2, 3, etc.

The author has constructed what he terms an "Abridged Appraisal Form" based on an analysis of those criteria which best represented the major activities of which they are a part. This form represents the 11 major health activities of the longer form and contains in all 22 criteria. The correlation between scores obtained with the official form and this abridged form showed a very markedly close correlation. Such a form may well be used to make a hasty preliminary appraisal and to predict the probable result when the official form is used. It should not be used as a substitute for the Appraisal Form itself for one of the chief values of the longer form is that it makes the user think of the relationship between the various component parts of the health program.

In discussing changes the author points out the fact that the Appraisal Form has been constructed with the

idea in mind of revising it from time to time as better standards and values may be worked out, and more important still, as new public health activities become generally accepted.

The entire volume is thoroughly scientific in its approach, is well illustrated with tables and figures and deductions so carefully made that we may accept with confidence the author's conclusion that the "study has produced evidence to show that, so far as can be judged at present, the principle of the Appraisal Form is sound, and its application is practicable and reliable."

The typography and make-up of the book make it readable and attractive, and the paper has been chosen to add to its appearance

CARL E. BUCK

Prohibition: Its Industrial and Economic Aspects—*By Herman Feldman, Ph.D. New York: Appleton, 1927. 415 pp. Price, \$2.00.*

One of the most difficult parts of the problem of estimating the effect of prohibition is the amassing of the real facts with reference to the use of alcoholic beverages. It is exceedingly easy to get thousands of opinions on this subject, but it is exceedingly difficult to arrive at a sufficient body of facts which, when judged by objective criteria, render the decision obvious. Dr. Feldman has written an exceedingly interesting book, as all books on this subject are. The very recital of contrasting opinions on the subject of prohibition must be of interest to the social-minded worker. However, Dr. Feldman attempted to go still farther than this, and by means of questionnaires distributed very widely by the American Management Association, secretaries of the chambers of commerce of the principal industrial cities of the United States, and by reference to various trade organizations' lists of members, coal mines, and electric railway associations, he has obtained a body of fundamental data used in arriving at

the conclusions of this study. In all, some 900,000 employes were engaged in those companies returning the questionnaires and including the concerns visited by the writer over 1,250,000 employes were entered on the pay-roll. Less than 80 per cent of these were males. The questionnaire covered the following six general topics: discharges and labor turnover on account of drunkenness; absences or tardiness because of drunkenness; accidents caused by excessive drinking; productivity and prohibition; general economic effects; and, finally, a statistical compilation covering the number of workers discharged, number of accidents and number of absences in pre-prohibition and prohibition years.

The author further attempts to answer certain other fundamental questions by reference to the available statistics on the consumption of various other beverages, the addiction to the drug habit and the change from the saloon as the Poor Man's Club, to sports, the radio and home.

The conclusion is finally reached that the advantages or disadvantages of prohibition must be judged over a long-time period, and on this basis the economic loss due to prohibition is not a serious problem. In addition to this, the opinion of the industrial employers and executives appears to be that prohibition is favorable to production. On this point, however, employers themselves admit their inability to provide sufficient data in addition to their opinions. There appears to be satisfactory evidence that prohibition has had the effect of stimulating the consumption of other foodstuffs, a change which has a vast economic importance in the opinion of the author. In conclusion, the author reaffirms his belief that the next few years will be the ones which will fix the status of prohibition, the results depending not on the enactment of statutory prohibition, but on the achievement of prohibition in fact.

LEONARD GREENBURG

Convalescence: Historical and Practical—By John Bryant. New York: The Burke Foundation, White Plains, 1927. 261 pp. Price, \$5.00.

This volume, which deals in a most interesting way with the historical and practical aspects of convalescent care, has been brought out to stimulate interest in this important but as yet little recognized phase of community health service.

The review of the literature which traces the development of convalescent care from the building of the Hotel Dieu and Charité Hospital in Paris in 1640 and 1650, shows an early appreciation, by certain leaders, of the principal requirements for rapid and successful convalescence. The best features of the retreats frequented by the wealthy after illness were incorporated in these early plans for institutions for the less fortunate. The *roulins* of these homes for after-care show remarkable agreement with the best practices today.

The review interprets the lack of material in the literature from 1878 to 1900 as reflecting the almost complete lack of interest in the subject in this country during that period.

The author recounts interestingly the experience from various sources such as the Burke Foundation and the Army, the practices in convalescent care which have proved worth while.

The person interested will find here rather full reporting of cases and treatments. Possibly the most important chapter is that dealing with the community aspects of the question, showing a need of one bed for convalescence for every ten beds for acute condition, and it is pointed out that deficiencies in this quota are probably more serious than a slight shortage of beds for acute illness.

A hopeful note is sounded in the review of the last few years as it is stated that nearly 3,000 beds per year are now being provided in this country for convalescence.

W. F. WALKER

Der Kokainismus—By Prof. Dr. Hans W. Maier. Leipzig: Thieme, 1926. 269 pp. (22 ill.) Price, Goldmark 17.50.

In the reviewer's opinion, this is the first and only comprehensive work on the subject of cocaineism. Prof. Maier is well known in the psychiatric world as a teacher, practitioner, and writer. Having been Bleuler's right-hand man for over 20 years, he has now succeeded his chief as head of the Burghölzli Clinic of Psychiatry at Zurich.

The author starts his work with a historical description of cocaineism. He describes the use of coca leaves as a food, in the form of chewing. This custom, which is still in practice among the South American Indians, existed when the Spaniards conquered the Incas. When the Spanish conquerors tried to suppress this habit among the natives, and found it impossible, they placed a heavy tax on it. As a matter of fact, it soon became a question whether chewing of coca leaves was really harmful to the average native. Moderate chewing had its defenders even then, as it has today.

In chapters II and III the author gives a full account of how the alkaloid cocaine was discovered by Niemann of Göttingen. He then gives the detailed processes of manufacturing it for commercial use, its chemistry, its demonstration in the cadaver, and simple tests of its presence in the living person. The physiological effects of the drug are taken up in chapter IV.

A very interesting chapter in the cultural history of medicine is chapter V, wherein the author gives the history of the development of cocaineism and its geographical dissemination since its discovery and use in medicine. The most interesting part to the reviewer is the author's description of Prof. Freud's experiments with cocaine, which he began in 1883. The introduction of cocaine as a local anesthetic in ophthalmology, by

Koller, was largely due to Freud's works.

The evil effects of cocaineism soon became apparent. The author quotes an editorial to this effect, from the *New York Medical Record* (May 29, 1886), showing that we kept abreast with Europe in this respect. Numerous reports of cocaine poisoning appeared everywhere. Psychotic states, resulting from chronic cocaine ingestion, were first reported by Magnan, in Paris, in 1889.

Chapter VI treats of the effects of cocaineism on man. The author states that snuffing is the most frequent way of taking cocaine since 1915. The physical as well as the mental symptoms given by various writers are thoroughly described.

Among the special symptomatology, Prof. Maier discusses acute and chronic cocaineism, subacute cocaine deliria, the cocaine delusion, etc., citing many interesting clinical records.

The material upon which Prof. Maier based his observations consisted of one hundred cocaine addicts observed by him, and of some case histories from other Swiss psychiatric hospitals. The male sex shows a greater representation in cocaineism in Switzerland, as well as in Italy. "The treatment," the author states, "must be extremely individual. Every case has its own peculiarities. To get to the root of the evil, it is therefore necessary to make a thorough psychic examination." Prof. Maier gives a full account of the methods of procedure in the treatment of acute and chronic cocaineism.

Chapter VII discusses cocaineism as a social danger, the legal way of combating it by international paths, in which he shows the progress made so far, the countries participating in it, and the methods adopted.

It is unfortunate that this work is not available to English-speaking readers. The reviewer hopes that an English translation will soon be made.

A. A. BRILL

Feeding the Child from Two to Six
—*Mary Frances Hartley Barnes.*
New York: Macmillan, 1928. 206
pp. Price, \$2.50.

This book fills a real need. It puts into practical form the essentials of dietary selection and preparation for the "runabout" ages. The author has faced the real problems of feeding children at home and in camps and institutions. She has eliminated the confusing nonessentials and put in the language of the average parent those facts about food and feeding upon which the various authorities agree. Such a contribution should be helpful to doctors, nurses, social workers and home economics students as well as parents. The references to constipation, malnutrition and certain psychological problems are merely given to suggest the common aspects of these conditions which are related to food—there are of course other causes at work in many such cases. The author appears to regard the appetite as a rather reliable guide to the quantity necessary at each meal for children who are to be kept healthy, instead of insisting upon a mathematical caloric total, and in this belief she has the support of the reviewer.

LEROY A. WILKES

How to Cook for Children—By
Estelle M. Reilly. *New York: Putnam, 1927.* 245 pp. Price, \$1.75.

Children these days are claiming their share of attention from nutritionists. A mother of six children has prepared a book for other mothers, based on her own experiments and the findings of psychologists, pediatricians and nutritionists. In chatty style the author analyzes the values of various foods, tells mothers how to select foods for their children and how to prepare them. Menu suggestions for the child from 18 months to 3 years are given in addition to the menus for normal healthy children over 3 years of age. A feature of the

book that will help the mother who is so often perplexed about the birthday party for the runabout is the party menu for hot or cold weather. The book will whet the food imagination of any mother who is struggling to combine nutrition principles and attractive varied daily menus.

Nutrition—By *Walter H. Eddy.*
Baltimore: Williams & Wilkins, 1928.
223 pp. Price, \$2.50.

What comprises a complete food, what foods we need, how much we should eat, and the story of vitamins from their discovery through their analyses, and how they function, is told to the layman in a language free from technicalities. Professor Eddy has done much by his writings to familiarize the housewife with the scientific findings of the nutrition laboratory and the mother who aims to be intelligent in regard to the health building of her family can profitably add this to the home library. Business people, too, would be influenced in the selection of their foods by a reading of this book.

The Health and Happiness Series—

By *S. Weir Newmayer, M.D., and Edwin C. Broome, Ph.D., LL.D.*
New York: American Book Co., 1928.

Book I. The Play Road to Health.
144 pp. \$.64.

Book II. Health Habits. 207 pp.
\$.72.

Book III. The Way to Keep Well.
264 pp. \$.84.

Book IV. The Human Body and Its Care. 314 pp. \$.96.

In the first book of the series health is dramatized for the very young children and in the succeeding titles, health habits, personal hygiene and keeping well, and the hygiene of individual and community are emphasized. This series has been prepared as supplementary reading work and as aids to the school health education program.

Labor Protection in Soviet Russia—

By George M. Price, M.D. New York: International Publishers, 1928. 128 pp. Price, \$1.25.

This small but exceedingly interesting book presents a very logical story of the development of labor conditions in Russia from about 1860 to the present time. It is based on three visits of the author in 1913, 1922 and 1927 to Russia, during which times he was enabled to study the conditions of labor in great detail. The book is plainly a statement of fact obtained on the occasion of these visits, and to one who is interested in the improvement of labor conditions and the development of this aspect of the social program it is a very important and succinct document.

The industrial hygienist will find much to interest him in this volume, and, judging by the progress made in Russia during the past few years along these lines, there remains much hope for major contributions from this country.

LEONARD GREENBURG

Bulletin of the Maryland State Department of Health—Vol. 1, No. 3, April, 1928.

This publication is the third of this nature presented by the Maryland State Department of Health. It strives to make public the more interesting and outstanding engineering studies and reports of that department.

The first two papers are concerned with shellfish. The data compiled in the one describing the oyster findings in Chesapeake Bay and its tributaries by investigations conducted from March, 1925, to January, 1927, are particularly useful at this time when the status of shellfish investigational results is still unsettled.

Two papers by Wolman, one on rational water consumption and another on the rôle of iron in the activated sludge process, are well worth reading.

Sewage treatment receives a fair proportion of space. Schaetzle has presented by himself and in collaboration with others three good reports, one on tannery waste treatment, another on the effect of liquid chlorine application to trickling filters, and a third covering observations on sludge digestion at a small treatment plant.

The last 37 pages of the pamphlet give the proceedings of the First Annual Conference of Maryland Water and Sewage Plant Operators.

ARTHUR P. MILLER

Public School Plumbing Equipment

—By Minor Wine Thomas, Ph.D. New York: Little & Ives, 1928. 128 pp. Price, \$1.50.

The aim of this book is to bring together and present the necessary criteria for judging plumbing equipment for use in the modern school. The necessary standards for the equipment of lavatories and toilets have been obtained from certain experimental evidence and from experience. In this manner the author has arrived at standards both as to material and design for the judgment of equipment to be used in the school building. A check list is provided so that each portion of the toilet room and lavatory may be judged on the basis of the standards adopted.

This volume should be of value to architects interested in the design of school buildings and to members of the school board. For the public health worker it should find good service in surveys of present school equipment.

LEONARD GREENBURG

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

Yellow Fever—Two articles presenting an interesting resumé of yellow fever on the west coast of Africa, a note on epidemiologic research, and resolutions of a conference on control methods.

ANON. Yellow Fever in British West Africa. *Pub. Health Rep.*, 43: 31 (Aug. 3), 1928.

Preparalytic Poliomyelitis—A report of observations on 106 cases in which convalescent serum was used, which emphasizes the importance of early diagnosis. The authors conclude that convalescent serum gives a low mortality rate and low rate of paralysis, especially of the severer grades.

AYCOCK, W. L., and LUTHER, E. H. Preparalytic Poliomyelitis. *J. A. M. A.*, 91: 6 (Aug. 11), 1928.

Midwifery Supervision—The problem of training and supervising negro midwives in Georgia is discussed. The author asks if the employment of a physician in each county to supervise the midwives is the most effective method.

BOWDOIN, J. P. The Midwife Problem. *J. A. M. A.*, 91: 7 (Aug. 18), 1928.

Sickness Rates in Industry—A 10-year record of industrial sickness rates shows no appreciable decline. The outstanding causes are common colds and "indigestion."

BRUNDAGE, D. K. Trend of Disabling Sickness among Employees of a Public Utility. *Pub. Health Rep.*, 43: 30 (July 27), 1928.

British Cancer Campaign—This committee report reviews British cancer mortality statistics and outlines the national and municipal activities in research and control.

BUCHANAN, G. S. Public Action in Regard to Cancer. *Lancet*, 2: 4 (July 28), 1928.

Progress in Nutrition—Another of the author's summaries of progress in nutritional research of clinical observations. Invaluable to the field worker interested in health education.

BURNETT, F. L. Progress in Nutrition. *Northeast J. Med.*, July 26, 1928.

Poliomyelitis Prophylaxis—The use of convalescent serum as a prophylactic treatment against poliomyelitis in contacts is recommended—a 10 c.c. dose for children and 20 c.c. for adults.

FLEXNER, S., and STEWART, F. W. Specific Prevention and Treatment of Epidemic Poliomyelitis. *New England J. Med.*, 199: 5 (Aug. 2), 1928.

Epidemiology of Infections—A review of our present-day knowledge of the epidemiology of poliomyelitis, diphtheria, and scarlet fever by the director of the infectious disease department of the Rudolph Virchow Hospital in Berlin.

FRIEDMANN, ULRICH. Epidemiology of Children's Infectious Diseases. *Lancet*, 2: 5 (Aug. 4), 1928.

Diphtheria among Immunes—Among 11,608 Edinburgh children either found immune to diphtheria or immunized there occurred 58 cases of the disease with no deaths.

GRIERSON, A. M. M. Diphtheria Occurring in Sickened and Immunized Children. *Med. Off.*, 40: 3 (July 21), 1928.

Public Health Administration—What is wrong with health practice? Chiropractors, unsympathetic practicing physicians, untrained sanitarians, and industrial hygienists all come under

searching scrutiny. An excellent paper, all too brief.

HARRIS, L. I. Proposals for Next Steps in Preventive Medicine and Public Health. *J. A. M. A.*, 91: 8 (Aug. 25), 1928.

Vitamin B Deficiency—The symptoms of partial vitamin deficiency—loss of weight, spasticity of limbs, rigidity of neck, restlessness and fretfulness—occurring in infants whose mothers are fed a vitamin B deficient diet disappeared when fed yeast.

HOOBLE, B. R. Symptomatology of Vitamin B Deficiency in Infants. *J. A. M. A.*, 91: 5 (Aug. 4), 1928.

Goiter Prevention—A summary of a wide experience in goiter prevention by iodine administration, showing that it is effective and that it does not produce hyperthyroidism in old goiters. This is an effective answer to the calamity howlers who decried the general administration of iodine.

KIMBALL, O. P. The Efficiency and Safety of the Prevention of Goiter. *J. A. M. A.*, 91: 7 (Aug. 18), 1928.

Milk Supply Supervision—The Indiana health department program is outlined. It includes maintenance of laboratory service, general dairy inspection, uniformly effective municipal ordinances, elimination of tuberculosis and contagious abortion from herds, and education of the public to demand pasteurized milk.

KING, W. F. Control of Public Milk Supplies. *J. A. M. A.*, 91: 8 (Aug. 25), 1928.

Communicable Disease Control Measures—A plea for the search for nasal carriers of diphtheria, scarlet fever, measles, and chicken pox as a function of the local health department's epidemiologic service.

LEWIS, D. M. Insufficiencies in Methods of Control of Certain Respiratory Diseases. *Med. J. & Rec.*, 128: 3 (Aug. 1), 1928.

Measles Prophylaxis—Another report of successful prophylaxis against measles in a child-caring institution by means of Tunncliffe's anti-measles serum.

PETERMAN, M. G. Prevention of Measles. *Am. J. Dis. Child.*, 36: 1 (July), 1928.

Occupational Therapy—Occupations found suitable for tuberculous patients at Leysin clinics should be suggestive for health workers interested in problems of occupational therapy.

ROLLIER, A. The Work-Cure in Surgical Tuberculosis. *Brit. J. Tuberc.*, 22: 3 (July), 1928.

Measles Prophylaxis—A report of a series of experiences in which convalescent measles serum was found a safe and effective preventive when given in adequate dosage within the first three days after exposure.

SUTHERLAND, D. S., and ANDERSON, D. S. Serum Prophylaxis in Measles. *Lancet*, 2: 4 (July 28), 1928.

Relapse in Tuberculosis Convalescents—The importance of post-sanatorium care for tuberculosis convalescents is stressed in this paper. With proper aftercare 80 per cent of one group of convalescents were at work 7 years after discharge, whereas 52 per cent of a group inadequately cared for had relapses.

TAYLOR, H. L. Relapse in Pulmonary Tuberculosis. *Am. Rev. Tuberc.*, 18: 1 (July), 1928.

Community Nursing—A discussion of the problems of oversupply of private duty nurses and failure to make a complete utilization of public nursing service.

WINSLOW, C.-E. A. The Larger Problem of Community Nursing. *Pub. Health Nurse*, 20: 7 (July), 1928.

ERRATA

On page 1083 of the August *JOURNAL*, two references to the *Northeast J. Med.* should have read *New England J. Med.*

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Detroit, Mich.—Under the title, "Detroit's Healthiest Year," the 1927 report of the Health Department is published in the January bulletin. The report opens with a statement of aims and methods. The average death rate from 1923 through 1927 was 11.6, as compared with a rate of 14.4 for the period 1913 through 1917. This rate of 11.6 represents a saving of 16,940 lives over the number who would have died if the earlier rate of 14.4 had prevailed. More striking is the decrease in infant mortality from 115.4 for the period 1913-1917 to 80 for the years 1923-1927, a saving of 5,570 babies. A very pronounced drop in the death rates of what are usually the city's most important causes of death—pneumonia and heart disease—to rates of 98.8 and 135 per 100,000 population, respectively, is noteworthy.

There was a considerable increase in rabies, from 233 animals examined with 89 positive findings in 1926 (227 people given anti-rabic treatment) to 442 animals examined with 265 positive findings (520 persons treated) in 1927. A severe type of diphtheria continues, with 11 deaths per 100 reported cases.

Results of bacterial analyses of pasteurized milk tabulated by months show that 69.8 per cent of them were below 50,000 in 1927 as compared with 55.9 per cent in 1926. This city of 1,290,000 population has an annual consumption of milk of 51½ million gallons.

In 1925 the infant mortality rate for the city as a whole was 80.1, while the rate for babies who attended the prenatal clinics of the department was 69.5. In 1926 the general infant mortality rate was 85.1, that for the 2,019 babies born to mothers who attended the prenatal clinics being 55.4.

The report abounds in excellent sta-

tistical tables and charts, accompanied by descriptive text. A classified financial statement and a personnel chart add value to the report. It is written in semi-popular style, covering problems of interest to laymen as well as to public health workers.

Palo Alto, Calif.—Palo Alto's organization chart for 1927 shows that the health personnel for this city of 11,900 consisted of a health officer, a dairy and food inspector, 2 public health nurses, a sanitary inspector, a bacteriologist, and a clerk. The latter 2 also perform certain duties for other city departments. An expenditure of \$1.03 per capita is recorded. The flyleaf of the report bears an effective chart of Palo Alto Public Health Milestones, arranged on the order of the A. P. H. A. historical chart. The first health officer here was appointed in 1894 (on a full-time basis in 1910), and an assistant was added in 1914.

A death rate of 11.1 was recorded, 48.5 per cent of the 132 deaths occurring among persons over 70 years of age. An infant mortality rate of 21.9 is noteworthy, the rate in 1926 being 29.6. During the year, there was an increased incidence of poliomyelitis in the state, Palo Alto having 15 cases with no deaths. "In the control of communicable diseases a policy of always giving full publicity to the situation has been followed and has, it is felt, thoroughly justified itself."

Ten years ago, a public health nurse was first employed in this city. The plan of having the school and health department work combined and done by one set of nurses has been followed successfully since the beginning. In this arrangement the salaries and transportation of the nurses have been shared

jointly with the school board, while the supervision has been in the health department.

Colorado Springs, Colo.—Beautiful photographs of the surrounding country feature the Colorado Springs Health Department report for 1927. A psychiatric clinic was organized for work in the county, "the outgrowth of a demand which has been felt and recognized by citizens, social workers, teachers, and others interested in the health and education of children."

It is reported that during the past 15 years only 45 cases have acquired and developed tuberculosis in this city of 36,000. A review of the records of 30 cases which have died in the past 10 years shows that 14 of them were cases of tuberculous meningitis who died in infancy or childhood. These were in most instances children living with parents who were known to be tuberculous. The resident death rate from pulmonary tuberculosis for the past 10-year period is recorded as 4.4 per 100,000 population.

Improvement in the milk supply is indicated by bacteriological results. Average bacterial counts in 1925 were 144,200; in 1926, 51,700; and in 1927, 24,700. An ordinance has been framed corresponding closely with the Standard Ordinance of the U. S. Public Health Service.

Nova Scotia—The population of the province in 1927 numbered 523,837. Births are classified by counties, cities and towns, by years, the birth rate for the year ending September 30, 1927, being 21.2. A crude death rate of 11.9 and a standardized rate of 10.5 are recorded. An infant mortality rate of 90.8 is calculated, individual rates by counties varying from 43.7 to 141.7. Except for 1925 and 1926, the rate from tuberculosis has been steadily falling, and the Tuberculosis Commission is

credited with a comprehensive control program.

An unusually severe outbreak of infantile diarrhea occurred in the mining district around Glace Bay during the months of August and September; 65 per cent of the 60 deaths among infants were under 9 months of age. "The majority of these infants were or had been fed on cow's milk. . . . The use of raw milk in a place where there existed no means of protecting or preserving it, in an area where outdoor toilets are extensively used, and all the conditions present for the breeding of flies, prepares the way for a very rapid spread of communicable disease of any kind once it makes its appearance." Following this outbreak, recommendations for preventing recurrence, and a set of by-laws regulating the milk supply were submitted to the council of this district. In general, fewer communicable diseases than usual were reported in the province.

Pasadena, Calif.—This 1927 Health Department report contains a table of contents, a letter of transmittal, listing outstanding features of the year's work, photographs of the new city hall in which the department is housed, a health center, and a preschool conference, good statistical charts and tables, and interesting summaries of the divisions.

The milk ordinance was amended to provide, among other things, that all milk handlers be regularly physically examined. The first annual Tournament of Health Week, May 1-7, in conjunction with the Council of Social Agencies, was sponsored. Additional health conferences were established by the child hygiene division in coöperation with the Parent-Teacher Associations. "The women of the Pasadena Civic League who assisted the inspection division of the health department during the past year and served without pay, are to be commended for their interest and work." A campaign for immunization against

diphtheria among children under 12 years of age has been waged.

This city of 80,192 population reports a general death rate of 10.9, a tuberculosis mortality rate of 53 (per 100,000), a birth rate of 14.7, and an infant mortality rate of 53.

Quincy, Mass.—The activities of the Quincy Department of Health for the year 1927 appear in a 9-page mimeographed report modelled on the scoring system adopted by the American Public Health Association. In 1926, the Field Director of the American Public Health Association appraised the activities of this city of 65,275 people. At that time a score of 711 out of a possible score of 1,000 points was reached. During 1927, the city itself surveyed its activities and considerable improvement was noted as a result of the adoption of recommendations.

A death rate per 1,000 population of 8.6 and an infant mortality rate per 1,000 live births of 56.4 are reported. Total expenditure for health work during 1927 amounted to \$55,303.08; the per capita cost being 84½ cents.

Bradford, O.—The sanitary survey of Bradford, O., is the first of a series of similar surveys of the incorporated towns of Miami County, conducted under the auspices of the Miami County Board of Health. On May 3 and 4, 1928, every house was visited and the residents were interrogated with reference to the number in the family, age, sex, births and deaths and other data pertaining to water supply, milk supply, previous illness, etc. The premises were inspected with special reference to sanitary conditions of wells and toilets, the privy conditions presenting one of the largest sanitation problems of the town. A brief history of the town from its founding in 1865 is of interest, and is followed by the vital statistics report. In 1920 the town had a population of

1,503, in 1928 an estimated population of 1,050, the loss of 498 being accounted for by the removal of certain activities of the Pennsylvania Railroad from the town. During the present survey 335 homes were visited and data obtained from 231, totalling 895 persons. Of these, 453 were male and 442 female. A death rate of 14.4 and a birth rate of 22.6 per 1,000 population in 1927 are recorded. A large supply of Bradford's milk is pasteurized, and practically all milk used is controlled by the Board of Health's inspection. The per capita consumption is 0.48 pint daily.

Suggested improvements follow each separate sanitary problem discussed, and this 10-page mimeographed report concludes with a section summarizing all principal recommendations given by the surveyors.

A. I. C. P.—The 84th annual report of the A. I. C. P. reviews the association's activities for the fiscal year 1926-1927. A 2-page summary of the family welfare "services you made possible during 1926-1927" gives an enlightening survey of the type and volume of the work. The expenditures of the various bureaus and committees, with descriptions of the work of each of these sections, are listed, and total \$1,276,170. Detailed events of the A. I. C. P. since its organization in 1843 graphically describe the progress which has been made during the past 84 years. A page devoted to the "Officers and Managers" is followed by a chapter entitled "The Larger Task Ahead—with yesterday's problems solved come tomorrow's unmet needs."

The last half of the report, printed on paper having a dull finish in contrast with the glossy finish of the first half, is given over to committee memberships, bequests, legacies, funds and gifts. The report is bound in blue covers and is attractively arranged with chapter or section headings well selected to arouse the

interest of the lay reader. Interspersed throughout are many excellent photographs of individuals or groups helped by the association, together with a picture of one of the 4 attractive boys' camps conducted by the A. I. C. P., where boys spend "glorious weeks of life in the woods, plunging every day in lakes and rivers, learning to be 'reg'lar fellers' by the give and take process, growing both in desire and ability to choose between things worth while and their opposite."

Brookline, Mass.—The report of the Brookline Board of Health for the year ending December 31, 1927, opens with a financial statement of the activities of the board for the past 4 years, together with a recommended budget for 1928 of \$258,355, \$10,084 more than the amount appropriated in 1927.

In April, 1927, a health survey was made at the joint request of the Health Department and the Brookline Friendly Society. On the basis of the *Appraisal Form* of the American Public Health As-

sociation, a total of 848 points out of a possible 1,000 was obtained; tuberculosis control, prenatal work, preschool work, sanitary inspection and water supply receiving full score.

In 1923 an intensive campaign to secure the immunization of all children was started and has been continued each year since. During the 4 years previous to 1923 there were 209 cases with 9 deaths, as compared with only 43 cases and no deaths since that year. Of these 43 cases, there were none who had had the protective treatment.

A mortality rate of 11.06 per 1,000 inhabitants in 1927, in contrast to 11.39 in 1926, is noteworthy. A total of 615 babies were born during the year, 43 of which were to non-resident parents. Thirty-eight deaths of infants under 1 year (stillbirths excluded) occurred in this city of 45,021 people (estimated as of July 1, 1927). Brief but inclusive reports of the different bureaus of the department follow the health officer's report and conclude the report.

BOOKS RECEIVED

PUBLIC HEALTH AND HYGIENE (2d ed.). Edited by William Hallock Park. Philadelphia: Lea and Febiger, 1928. 902 pp. Price, \$9.00.

THE DETERMINATION OF HYDROGEN IONS (3d ed.). By W. Mansfield Clark. Baltimore: Williams & Wilkins, 1928. 717 pp. Price, \$6.50.

BLOOD AND URINE CHEMISTRY. By R. B. H. Gradwohl and Ida E. Gradwohl. St. Louis: Mosby, 1928. 542 pp. Price, \$10.00.

ULTRA-VIOLET RAYS IN THE TREATMENT AND CURE OF DISEASE. By Percy Hall. St. Louis: Mosby, 1928. 236 pp. Price, \$4.50.

RECENT ADVANCES IN CHEMISTRY IN RELATION TO MEDICAL PRACTICE. By W. McKim Marriott. St. Louis: Mosby, 1928. 141 pp. Price, \$2.50.

BACTERIOLOGY FOR NURSES. By Charles F. Carter. St. Louis: Mosby, 1928. 213 pp. Price, \$2.25.

DIABETIC MANUAL FOR PATIENTS. By Henry

J. John. St. Louis: Mosby, 1928. 202 pp. Price, \$2.00.

SIXTEENTH ANNUAL REPORT OF THE UNITED FRUIT COMPANY, MEDICAL DEPARTMENT. Boston: United Fruit Co., 1928. 368 pp.

HEALTHY GROWTH. A Study of the Relation between the Mental and Physical Development of Adolescent Boys in a Public Day School. By Alfred A. Mumford. New York: Oxford, 1927. 348 pp. Price, \$5.00.

THE HEALTH OF YOUTH. By Dr. Florence Meredith. Philadelphia: Blakiston, 1928. 535 pp. Price, \$1.60.

THE GENESIS OF EPIDEMICS AND THE NATURAL HISTORY OF DISEASE. By Clifford Allchin Gill. New York: Wood, 1928. 550 pp. Price, \$7.50.

SOCIAL WORK AND THE TRAINING OF SOCIAL WORKERS. By Sydnor H. Walker. Chapel Hill: University of North Carolina Press, 1928. 241 pp. Price, \$2.00.

NEWS FROM THE FIELD

HEALTH NEWS FROM TENNESSEE

TENNESSEE now has 23 full-time health departments. One was recently organized in Knox County, with Dr. A. E. Richards as director. The department staff will consist of the director, two nurses, a sanitary inspector and a clerk. Another full-time health department has also been organized in Monroe County.

Dr. John Shell has been appointed full-time director of the Carter County Health Department at Elizabethton, Tenn. Dr. Shell recently completed the training course for health officers given by the Tennessee State Health Department and Vanderbilt Medical School.

OPTIMISTIC "NO DIPHTHERIA" REPORT FROM QUINCY

MORE than 3,700 boys and girls of Quincy, Mass., have been immunized against diphtheria at clinics conducted by the local health department since the inauguration of its toxin-antitoxin treatment in May, 1927. The appeal for the protection of their children against diphtheria was made directly to the parents. Of the 3,700 receiving treatment more than 3,000 have been of school age. Quincy reports that since 1923 there has been a consistent decrease in diphtheria morbidity rate and the first 8 months of 1928 show a decided decrease over previous years. The records of the health department also show that no child who has been successfully immunized has contracted diphtheria. Now Quincy is endeavoring to eliminate diphtheria among preschool children by the establishment of weekly diphtheria prevention clinics and by

seeking the coöperation of parents of preschool children.

VISION OF SCHOOL CHILDREN TESTED

OF 2,000 school children examined by a specialist in defects and diseases of the eye under direction of the U. S. Public Health Service, 45 per cent needed glasses for school work. The children examined were representative of the general school population. The Surgeon General calls attention to the necessity of making visual tests of school children at least twice a year to detect nearsightedness which may progress rapidly within a year. The report shows that the nearsighted eye can usually be detected by the Snellen chart test. Farsightedness can always be discovered by this test chart.

It was discovered that 60 per cent of the children may read normally on the vision test chart and 32 per cent of these are definitely farsighted and are constantly straining the eyes in near work.

NEW ENGLAND HEALTH INSTITUTE

AT the Sixth Annual New England Health Institute held in Burlington, Vt., in September the several aspects of public health were discussed. Emphasis in the program was placed on preventable diseases, sanitation and engineering, tuberculosis, child hygiene, public health nursing, the relation of social work to public health, mental hygiene, industrial hygiene, food, drugs and nutrition.

The institute was directed this year by Charles F. Dalton, M.D., secretary of the Vermont Department of Public Health, and it was sponsored jointly by

the State Health Departments of New England, the U. S. Public Health Service, several New England colleges and voluntary health agencies.

Field offices have been established in many of the interstate sanitary districts of the country.

SEWAGE CONFERENCE AT CLEBURNE, TEX.

A SPECIAL sewage field conference was held at Cleburne, Tex., August 27, to discuss the recent developments of vacuum degasification at the Cleburne sewage disposal plant. This plant began its operations January 1, 1928, and the work accomplished seemed to merit further study according to the sanitarians who were influential in calling the August conference together. From reports of those in charge of operations of the plant it is claimed that this new process minimizes odors, increases the rate of sedimentation, and sludge digestion, eliminates foaming, and is helpful for the entire purification cycle.

Dr. J. C. Anderson, Texas State Health Officer, was chairman of the conference, and Dr. F. E. Giesecke, director of Engineering Research of Texas A. & M. College, was vice-chairman. Several valuable papers on the process were read, and briefer contributions made by engineers and sanitarians from several western and southwestern states.

NEW SECTION ON SANITARY ENGINEERING OF U. S. PUBLIC HEALTH SERVICE

A SECTION on sanitary engineering has been established in the Domestic Quarantine Division of the U. S. Public Health Service, to coördinate the engineering activities of the Domestic Quarantine Division and make practicable their detailed supervision by an experienced sanitary engineer. One of the pieces of work to be directed immediately will be the combination of the shellfish sanitation program with that of the interstate districts. Heretofore the office of shellfish sanitation has existed as a separate unit.

CINCINNATI FINANCES A HEART PROGRAM

THE Community Chest of Cincinnati, O., has appropriated \$7,350 for the first year's work of the Cincinnati Heart Council recently established and the Amanda Bernheim Foundation has made an appropriation of \$5,000.

MISSOURI WATER CONFERENCE MEETS

THE Fourth Annual Meeting of the Missouri Conference on Water Purification will be held at Hannibal, Mo., November 15, 16, 17, 1928. The program will include topics on the following subjects: Water purification, deep and shallow well supplies and sewage treatment.

TEXAS SANITARIANS TO HOLD SHORT SCHOOL

THE Sixth Annual Texas Sanitarians' Short School will be held November 7-10, at San Antonio, Tex., with headquarters at Gunther Hotel and the City Health Department.

Dr. W. A. King, City Health Officer of San Antonio, president of the Texas Association of Sanitarians, is director of the school. Dr. J. C. Anderson, State Health Officer, is chairman of the program committee and he is being assisted by C. M. Adams, J. Bryan Miller, Mary Kennedy, Dr. W. A. Dunn, Dr. A. H. Flickwir and Dr. L. H. Martin.

This short school is one of the series arranged for intensive training of sanitarians and is sponsored by the Texas State Department of Health, the Texas Association of Sanitarians, the American Public Health Association and local health departments. The committee anticipates an attendance of 300.

PERSONALS

DR. GERTRUDE STURGES, formerly Assistant Director of the Cleveland Health and Hospital Survey, and for 3 years assistant executive secretary of the New York Associated Out Patient Clinics, has been appointed a member of the staff of the Committee on the Cost of Medical Care, Washington, D. C.

ALDEN MILLS, formerly Secretary of the Portland City Club, Portland, Ore., and Allon Peebles, instructor of economics at Columbia University, New York, N. Y., for the past 4 years, have recently accepted appointments to the staff of the Committee on the Cost of Medical Care, Washington, D. C.

DR. FRANK J. FULLER, Health Officer of Potsdam, N. Y., since 1915, died August 4.

THOMAS B. OSBORNE, PH.D., for forty-two years chief of protein research of the Connecticut Agricultural Experiment Station, New Haven, Conn., has retired from active directorship of the laboratory, and Hubert B. Vickery, Ph.D., is in charge. Dr. Osborne assumes the title of advisory biochemist.

DR. CHARLES H. NIELSON, president of the St. Louis City Medical Society, has been appointed Associate Dean of St. Louis University School of Medicine to succeed the late Dr. Don R. Joseph.

DR. RAPHAEL B. DUFEE, Bisbee, Ariz., was elected president of the Arizona Public Health Association.

DR. FRANK C. STORY has taken up his duties as health officer of Wayne County, Ga.

DR. FREDERICK E. JACKSON has been elected president of the Indianapolis, Ind., Board of Health.

FREDERICK L. HOFFMAN, LL.D., of the Prudential Life Insurance Company,

Newark, N. J., on his return from a transcontinental air journey, stopped in the Navajo country to assist the Bureau of Indian Affairs with the census of the Indians.

JANE C. ALLEN, for the last two years general director of the National Organization for Public Health Nursing, New York, N. Y., recently presented her resignation.

DR. ALBERT E. KYTE, Health Officer of the town of Montgomery, N. Y., died recently. Dr. Kyte had been health officer there since 1926.

W. C. BLASINGAME, who has held the position of director of the bureau of venereal diseases in the Alabama State Department of Health, has resigned to accept a position as director of the bureau of citizenship in the extension department of the University of Alabama, at Tuscaloosa.

DR. DOUGLAS L. CANNON has been appointed acting State Health Officer of Alabama, with full authority, until further notice. This vacancy was created through the death of Dr. S. W. Welch, who had been State Health Officer for many years.

GEORGE A. COOPER of the Monongahela West Penn Public Service Company, Fairmont, W. Va., has been appointed an Assistant Chief Business Specialist in the Division of Simplified Practice of the Bureau of Standards, U. S. Department of Commerce.

DR. EDWIN W. BATHURST has been appointed Health Officer of Edna, Calif.

DR. FRED J. WAMPLER has been appointed Professor of Preventive Medicine in the Medical College of Virginia, at Richmond, and Medical Director of the outpatient department. The September JOURNAL stated, in error, that these positions were in the University of Virginia.

American Journal of Public Health

and THE NATION'S HEALTH Vol. X No. 11

Volume XVIII

November, 1928

Number 11

Sanitation of Watersheds*

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THE sanitation of watersheds tributary to public water supplies is a matter of growing importance in these days of extreme human motility resulting from the development of the automobile and good roads. Catchment areas, once remote, sparsely inhabited and infrequently visited, have become easily accessible to the hosts of pleasure seeking motorists. This state of affairs is of primary importance in the case of those water supplies subject to no purification other than that afforded by storage alone or by storage and chlorination.

It is essential in considering this matter of watershed sanitation to recognize that the problems involved vary with the different types of watershed. A convenient and logical classification is as follows:

1. Relatively large river watersheds with cities and towns thereon
2. Watersheds of the Great Lakes
3. Watersheds of moderate area with storage reservoirs or natural lakes, giving many months' storage for the natural runoff
4. Small or moderately large watersheds with little or no storage

A different classification, given in the first edition of the *Manual of Water Works Practice* of the American Water Works Association, takes into consideration the presence or absence of filtration. For comparing water supplies as delivered, it is manifestly necessary to give proper weight to the artificial methods of purification in use. It is not proper, however, to consider the use or non-use of such purification methods when a comparison of sources of supply is involved.

It is impossible to treat large watersheds upon which there are municipalities discharging sewage directly into the stream, or industrial establishments pouring wastes of various kinds therein, in the same manner as sparsely populated upland drainage areas. For the sanitary protection of water supplies derived from heavily polluted

* Read before the Public Health Engineering Section of the American Public Health Association, at the Fifty-seventh Annual Meeting at Chicago, Ill., October 17, 1928.

streams, like the Hudson and Ohio Rivers, it is necessary to rely almost wholly upon water purification devices. Where supplies are taken from the Great Lakes, it is also difficult to accomplish much in the way of sanitary protection by watershed sanitation alone. In the case of the other two classes, watershed sanitation plays an important part in the maintenance of the purity of the supplies derived therefrom and this paper will deal with these two types of watersheds.

The most important hazard to water supplies is that resulting from indiscriminate discharge of sewage into the streams or other bodies of water from which water supplies are taken. The degree of danger will depend upon many factors: the population contributing sewage, the ratio of sewage to stream flow, the distance between point of sewage discharge and the water works intake, time of year, and the opportunities available for self-purification by sedimentation, sunlight and other natural processes.

On any populated watershed, besides the regular sources of pollution, there are sources from which pollution reaches the watercourses or reservoirs only intermittently, such as at times of melting snow or heavy rainfall. The classic epidemic at Plymouth, Pa., is an outstanding example of the infection of a public water supply by the excretions from a single typhoid case on a relatively sparsely populated watershed at the time of melting snow and freshet conditions.

Whenever there is a single human being upon a watershed, there is also a chance for dangerous pollution. With one person the chance is very remote for any serious consequences to occur but with every additional person upon that watershed there occurs an increased possibility of pollution and infection. It is impossible to fix a limit of permissible population; the fewer, the better.

Highways and railroads parallel to and crossing over water supply streams and reservoirs are well recognized sanitary hazards due to the fact that they render the streams and lakes accessible to many more people than would otherwise be the case. Regulations requiring locking of toilet compartments in passenger cars on the railroads only partly reduces the danger of contamination.

Lumbering operations and labor camps are difficult to control effectively, due to their semi-permanent nature, which often results in sanitary conveniences being crudely and improperly taken care of.

Among the recreational uses of watersheds in which occur some sanitary hazard are hunting and fishing. Fishing brings the transient visitor directly upon the watercourses or upon the reservoirs and lakes. The fisherman is never far from the water. The hunter will cross and re-cross tributary streams many times in the course of a single day,

and in duck-shooting the hunter will be directly upon the pond or reservoir.

Picnic parties are undesirable and in some ways are potentially more dangerous than hunting or fishing due to the fact that picnics are usually composed of a considerable number of people. Without proper sanitary conveniences, pollution of the ground and eventually of the watercourses is very likely to occur.

In the matter of boating upon and bathing in water supply reservoirs, there should be no difference of opinion. There seems to be, however, a tendency in recent years to overlook the hazard resulting from these practices, particularly where purification is resorted to. The recent Report of the Committee on Water Supplies of this Association¹ distinctly leans toward allowing such recreational uses of water supply streams and reservoirs:

Swimming in streams appears now to be the most common sanitary problem and the hardest to tackle, being so generally indulged in and so slight in its sewage pollution. We suspect the real objection to it is principally a mental and esthetic one, which, however, cannot be entirely overlooked.

This much is certain, that water consumers cannot look to the recreationist or other users to guarantee the safety of the supply. The consumers themselves can easily make the supply safe and entirely potable. It is preposterous to deny mountain recreation to the multitudes that the consumers may be spared the inconvenience of water treatment. The health department will succeed well if it holds recreational abuse in bounds and preserves such a degree of cleanliness as the pleasurable uses themselves dictate.

The committee apparently stands for cure rather than prevention, a policy directly opposed to the general policy of this Association. The intimation that swimming in streams is a matter of small sanitary significance from the standpoint of pollution is directly in contradiction of the facts as shown by the increase in bacterial content of swimming pool waters or in the waters at bathing beaches.

Analyses by the Massachusetts Department of Public Health have shown more bacterial contamination in the sea water among the bathers at Revere Beach than in Boston harbor waters 1,400 feet from the outlet of the South Metropolitan Sewer District.² The 1923-25 report of the Division of Water Supply Control of Chicago gives data showing the high bacterial content of the waters at Chicago's bathing places, including beaches, and outdoor and indoor swimming pools.³ Langdon Pearse, in the JOURNAL for June, 1927,⁴ referring to the pollution at bathing beaches, states: "In Chicago the pollution from the large number of bathers, however, is more important than the lake pollution from other sources."

The evidence is unmistakable that bathing in sources of water

supply is a real and not an imaginary sanitary hazard. This depends in large measure upon bathers' proximity to the water works intake—the nearer the intake, the greater the danger. The hazard is greater in small than in large reservoirs, and the more bathers, the greater the risk. It should be realized, moreover, that in relatively large reservoirs contamination and even infection can be carried several miles under favorable conditions of wind and currents. This was shown by the experience of Auburn, N. Y., in 1907, where infection by sewage of the feeder of Owasco Lake, its source of water supply, was carried to the water works intake a distance of 14 miles from point of infection,⁵ of which distance 10 miles were across the lake.

Actual evidence of contamination by fishermen, hunters and picnickers is difficult to obtain and evidence of infection, even more difficult. At Peabody, Mass., in 1913 there occurred an outbreak of at least 1,500 cases of intestinal disorder which was attributed after careful investigation by the State Department of Public Health to an infection by fishermen of one of the ponds used as sources of water supply.⁶

In connection with the recreational use of watercourses and reservoirs it should be recognized that, if such use is permitted, real estate developments will follow, particularly if the sources of supply are near centers of population. Once the barriers are removed there will be no stopping the increasing sources and acts of contamination. Those interested in the results of the removal of restrictions against recreational use of a water supply pond should refer to an article by X. H. Goodnough and the discussion thereof by Albert L. Sawyer.⁷

Other activities contributing to contamination are ice cutting, lumbering, and the establishment of labor camps, to which have been attributed outbreaks of water-borne typhoid fever. Instances of such outbreaks have been reported at Hillsdale, Mich.,⁸ Raybrook, N. Y.,⁹ and Ithaca, N. Y.¹⁰ While the actual ice cutting operations in winter are often conducted under sanitary supervision, there is usually no oversight of the men engaged in loading and hauling ice from the ice houses during the summer.

The first course of action for the sanitary protection of watersheds which naturally occurs to water works authorities is the purchase of watershed lands, particularly marginal areas around reservoirs and ponds and along watercourses. In the case of the North Jersey Water Supply Commission a marginal strip of land around the entire shore of the new Wanaque reservoir will be owned by the district. For the Honeoye Lake water supply development of the City of Rochester, N. Y., the consulting engineers, Hazen, Eddy and Fisher, have recom-

mended the purchase of large areas of land totally enclosing the proposed reservoir. Many other instances of heavy purchases of watershed lands could be cited.

The ownership of watershed lands allows thorough sanitary control of such lands and the prevention of much pollution which would otherwise occur. Large water supply developments permit the employment of sanitary police, but smaller developments must depend upon regular and reasonably frequent inspections by water works employes for preventing trespassing and acts prejudicial to the quality of the water supply. On those areas outside of water works lands, sanitary inspectors can be of much service in the matter of securing, largely through coöperative efforts, the maintenance of proper conditions on inhabited properties. Furthermore, arrangements with physicians practicing in the district for the prompt reporting of typhoid fever and other water-borne diseases will permit the water department to insist upon the necessary precautions with respect to the disposal of the infectious excretal discharges of the patients. It is obvious that sanitary patrol cannot prevent all sources or acts of contamination, but it can abate and prevent many such.

For sanitary policing to operate upon rational lines it is of distinct value for watersheds to be protected by rules and regulations enacted by the state department of health. In Massachusetts and New York the State Health Departments have been given authority by their respective legislatures to make rules and regulations for the protection from contamination of all sources of public water supplies within the borders of the state.¹¹ In both states this authority has been acted upon, and many of the water supplies are protected.

In general these regulations proscribe certain acts of contamination and regulate the distances at which sources of possible contamination may be located with respect to reservoirs, ponds and watercourses tributary to public water supplies. These regulations are not generally applicable to all supplies within the state but are enacted separately for individual supplies, and usually only when the local authorities express a desire for such rules and a willingness to enforce them.

In Massachusetts the rules and regulations are practically alike for all supplies while in New York the rules vary with the individual supplies according to local conditions. The latter policy is distinctly more rational. For a very complete discussion of the laws relating to the control of water supplies in New York State reference should be made to a paper by C. A. Holmquist.¹²

The following brief abstract of rules and regulations for Massachusetts watersheds indicates their nature:

No place for the temporary deposit of human excrement is allowed within 50 feet of the high water mark of reservoirs, ponds or watercourses and no place for the permanent deposit of such matter is allowed within 250 feet of such waters. Furthermore, no deposition of human excrement upon the ground is permitted at any point where it may be washed into the sources of the supply. The discharge of sink wastes or other polluted water directly into reservoirs, ponds or streams is forbidden as is such discharge into the ground within 50 feet or upon the ground within 250 feet thereof. The placing of garbage, manure or putrescible matter into sources of supply is forbidden as is the placing of such matter upon the ground within 200 feet. An exception is made, however, in the matter of the ordinary use of manure in agriculture as regards placing of such material upon the ground. Stables and other animal enclosures are forbidden within 50 feet of streams and reservoirs and are not allowed within 200 feet of these unless provided with suitable means of storing manure. Burials are forbidden within 50 feet of sources of supply. Provision is made in the rules for the approval by the state health department of new cemeteries upon the watershed. The discharge of manufacturing wastes into sources of water supply is forbidden. Sewer systems and sewage treatment plants must be approved by the health department and no private sewer is allowed with an outlet within 250 feet of reservoir, pond or stream. Hospitals for persons with infectious diseases cannot be located on watersheds without approval of the health department, and hospitals must make proper provision for the disposal of sewage. The same is true as regards tanneries, slaughter houses, and rendering plants. Bathing in ponds and reservoirs is prohibited and fishing and boating thereon is permitted only by special regulation of the health department. Ice cutting also is allowed only by special permit. Reports of infectious disease occurring upon watersheds must be kept accessible to the water works authorities.

The rules and regulations of New York State cover much the same ground. In most New York rules the limiting distances are greater with respect to reservoirs and primary sources of supply than in the case of watercourses tributary thereto. Furthermore, as previously stated, each set of New York rules is prepared with special reference to the local conditions affecting the particular supply for which the rules are enacted. Consequently, limiting distances vary for different supplies. Another difference lies in the fact that in Massachusetts natural ponds and lakes over 10 acres in area constitute "great ponds" and are the property of the Commonwealth, which has authority to exercise complete control of such waters. In the case of New York, riparian owners cannot be deprived of their rights in bodies of water without compensation therefor.

To determine the policy of other states in the matter of rules and regulations similar to those of Massachusetts and New York inquiries were sent to the chief engineers of health departments of all the states. As a result of these inquiries replies have been received from all but 1 of the 48 states. These replies are briefly summarized in Table I.

From this it will be seen that but 4 states prepare detailed and specific rules and regulations for the sanitary protection of water-

TABLE I

SUMMARY OF STATE REGULATIONS RELATING TO WATERSHED SANITATION IN THE UNITED STATES

Specific State Regulations	General State Regulations	Local Regulations by Munici- palities	State Regulations Being Revised	No Regulations	No Replies
Massachusetts	Arkansas	Colorado	Missouri	Alabama	South Dakota
New York	Connecticut	Louisiana	Tennessee	Arizona	
North Carolina *	Iowa	Ohio		California	
Vermont	Maine			Delaware	
Mississippi †	Maryland			Florida	
North Dakota ‡	Montana			Georgia	
	Nebraska			Idaho	
	New Hampshire			Illinois	
	New Jersey			Indiana	
	New Mexico			Kansas	
	Oklahoma			Kentucky	
	Oregon			Michigan	
	Pennsylvania			Minnesota	
	Rhode Island			Nevada	
	Utah			South Carolina	
	Virginia			Texas	
	Washington			West Virginia	
				Wisconsin	
				Wyoming	

* Rules applying to watersheds at four different sizes: (1) less than 20 sq. mi., (2) 20-50 sq. mi., (3) 50-100 sq. mi., (4) over 100 sq. mi.

† State Board of Health has assumed authority to make specific rules and regulations.

‡ State Dept. of Health has authority to make rules and regulations but has not exercised that authority.

sheds; namely, Massachusetts, New York, North Carolina and Vermont, although Mississippi and North Dakota have authority to do so but apparently have not availed themselves of this authority. Seventeen states control watershed sanitation by more or less general legislation; in 3 states municipalities have a certain amount of authority in the matter, while in 19 states there appear to be no regulations. In 2 states regulations are being revised. Of all the states, New York appears to follow the most logical procedure in the matter of watershed sanitation. Massachusetts is a close second and has an advantage in the fact that "great ponds" belong to the state.

It cannot be claimed that the mere enactment of rules and regulations constitutes an adequate sanitary safeguard. Such rules must be enforced and the enforcement rests in the main with the local authorities. Enforcement is not easy nor is it perfect, but there is no question as to the beneficial effects resulting therefrom.

In some quarters the view is held that watershed sanitation is comparatively unimportant as a means of protecting the purity of water supplies, and that the chief reliance should be placed upon water purification plants. Such a view is not wholly justified by facts. Table II gives the typhoid death rates of cities geographically.

TABLE II

TYPHOID DEATH RATE IN CITIES OF THE UNITED STATES IN 1927 BY GEOGRAPHICAL LOCATION

State Group	Population	Typhoid Death Rate per 100,000
New England	2,540,209	1.26
Middle Atlantic	11,789,633	1.41
South Atlantic	2,244,300	3.39
E. North Central	8,319,500	1.31
E. South Central	854,300	10.07
W. North Central	2,520,400	1.86
W. South Central	1,698,946	6.71
Mountain and Pacific	3,508,435	1.74

From *J. A. M. A.*, May 19, 1928

From this it will be seen that the lowest death rate from typhoid last year occurred in the New England states where for many years the general policy in the matter of water supply sanitation has been to rely upon storage and clean catchment areas. This fact does not warrant the conclusion that New England cities should rest on their laurels, but it does show that New England methods of water supply protection, irrespective of opportunities for improvement therein, have been as successful, measured by the typhoid death rates, as those of other states.

Policies applicable to New England and to other states with similar opportunities for securing upland sources of supply cannot be adopted in all states. On the other hand, it is not proper to advocate the general adoption of policies relating to watershed sanitation which are contrary to those followed for years in the East with such good results.

The previous statements should not be construed as belittling the value of water purification methods. In general, most surface water supplies should either be chlorinated or chlorinated and filtered. But there are four lines of defense against impure water, namely, watershed sanitation, long storage, chlorination, and filtration. When possible, all four lines of defense should be utilized to the fullest extent practicable.

REFERENCES

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- 2 *Rep. State Dept. Health & Mun. Council of Lynn upon Plan for Disposal of Sewage in Lynn—1916*, p. 29.
- 3 *Rep. Div. Water Supply Control, Chicago, 1923–25*.
- 4 Pearce, Langdon. Eliminating Pollution from the Great Lakes and St. Lawrence Waterways—Lake Michigan. *A. J. P. H.*, 17, 6: 599 (June), 1927.
- 5 *J. Am. Water Works A.*, 1914, p. 688, 1920, p. 42.
- 6 *J. New England Water Works A.*, 1920, p. 193.
- 7 *J. New England Water Works A.*, 1920, p. 151.
- 8 *J. A. M. A.*, 77, 22.
- 9 *N. Y. State Dept. Health, 1917, Rep.*, 2, p. 493.
- 10 *J. New England Water Works A.*, 1904, p. 431.
- 11 *Mass. General Laws*, Sect. 160, Chapt. 111. *N. Y. Public Health Laws*, Sect. 70, 71, and 73.
- 12 *J. New England Water Works A.*, 41: 261, 1927.

What We Are Learning about Accidents from Vital Statistics Records*

EARLE G. BROWN, M. D.

Secretary, State Board of Health, Topeka, Kan.

THE primary duty of all health departments is prevention—but not alone the prevention of the communicable diseases. Health departments are interested in all conditions which “make growth more nearly perfect, decay less rapid, life more vigorous, and death more remote.” Likewise, the individual is interested in the same problems.

For material on which to base the present discussion, data are used from the records of the Division of Vital Statistics of the Kansas State Board of Health. I am quite certain these statistics are comparable with those of any of the states in the U. S. Registration Area.

In the State of Kansas in 1927, only four diseases, and these all of a chronic type, caused more deaths than accidents. See Table I.

TABLE I
FIVE PRINCIPAL CAUSES OF DEATH IN KANSAS, 1927

	Number of Deaths	Death Rate per 100,000
Organic heart disease.....	2,612	142.3
Cancer, all forms.....	1,839	100.0
Cerebral hemorrhage.....	1,832	99.6
Chronic nephritis.....	1,534	83.4
Accidental deaths.....	1,345	73.1

Deaths from all causes in Kansas for the years 1914–1927, inclusive, total 273,801. Deaths from accidental causes for the same period total 15,682, or 5.7 per cent of the total. The percentage of accidental deaths by years varies from 4.2 per cent in 1918, the minimum, to 7.2 per cent in 1927, the maximum.

The only method of determining true health conditions is by a study of the death rates of a community. Perhaps it may be said, and correctly, that accidental deaths do not indicate health conditions; however, because they comprise approximately 6 per cent of total deaths, they have a very appreciable effect on the death rate of every community. In Kansas, the accident death rate per 1,000 population in the past 14 years has ranged from 0.51 in 1914, the minimum, to 0.73 in 1927, the maximum.

* Read before the Vital Statistics Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 16, 1928.

The success of accident prevention may in a way be measured by a comparison of automobile accident death rates with death rates of two of the principal preventable diseases which have been the object of consistent attack by the State Health Department in coöperation with city and county health departments. The comparison is made during the period 1914 to 1927, the former being the first year statistics are available for automobile accident deaths.

TABLE II

DEATHS AND RATES IN KANSAS PER 100,000 POPULATION FROM TYPHOID FEVER, DIPHTHERIA AND AUTOMOBILE ACCIDENTS

	Typhoid Fever		Diphtheria		Automobile Accidents	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1914	338	20.2	170	9.7	36	2.1
1915	196	11.7	245	13.7	45	2.6
1916	263	15.3	195	11.1	100	5.8
1917	332	19.1	136	8.6	112	6.4
1918	289	16.7	131	6.8	134	7.7
1919	135	7.6	191	10.7	116	6.5
1920	138	7.8	262	13.9	164	9.1
1921	155	8.6	382	20.9	154	8.6
1922	107	5.9	288	16.6	171	9.5
1923	111	6.1	151	8.7	213	11.7
1924	73	4.0	88	5.0	149	8.1
1925	101	5.6	71	3.5	235	12.9
1926	83	4.5	49	2.7	237	13.0
1927	66	3.5	75	4.0	253	13.7

Table II shows that death rates for typhoid fever and diphtheria have, with variations, decreased from 20.2 and 9.7 per 100,000 population to 3.5 and 4.0, respectively. Automobile accident death rates have, however, shown a steady increase from 2.1 in 1914 to 13.7 in 1927, with the exception of the years 1919, 1921 and 1924.

For comparison as to seasonal occurrence, studies were made by month, for the period 1923-1927, of three of the five principal types of accidental deaths.

Accidental drownings show a greater seasonal variation than any other one type of accident, as 76.1 per cent of these deaths occurred during the months of May, June, July and August.

Twenty-seven and one tenth per cent of the deaths from accidental falls occurred during the months of December and January. A study was not made, however, as to the month of occurrence of the injury. Obviously, the number of injuries of this type would be quite high during the winter months, especially when ice and snow were present on the ground.

Eleven and three-tenths per cent of the deaths from automobile accidents occurred during the month of August, when the days are warm and more automobiles are in use. It is also the season when great numbers of tourists are vacationing in their automobiles.

In our study of accident statistics, especial attention is directed to five principal types of accidents, which in the past 14 years have caused 8,922 deaths, or 36.8 per cent of the total, from accidents. These accidental deaths are shown in Table III.

TABLE III
FIVE PRINCIPAL TYPES OF ACCIDENTAL DEATHS

Accidental falls.....	2,542
Automobile accidents.....	2,118
Railroad accidents.....	1,879
Accidental drownings.....	1,214
Accidental burns.....	1,169

Twenty-five hundred and forty-two deaths, or 16.2 per cent of accidental deaths, resulted from accidental falls. We find in this type of fatal accident that approximately 58 per cent occur in the age group of 70 to 89 years, in that period of life when a slight misstep, tripping over a rug, or a fall from a bed or chair, may result in a serious injury and oftentimes the breaking of one or more bones. Frequently, due to the shock, death results in the course of a few hours or a few days. In many instances, death does not occur immediately and, due to old age and a lack of the necessary mineral elements for the growth or replacement of bone, the break does not heal. The result is that the individual becomes an invalid and remains practically helpless the remainder of his life.

In the 14-year period, 1,214 accidental drownings were recorded. Two-thirds of these drownings occurred in the age group under 20. In 1927 deaths from drowning showed a marked increase over previous years, due to flood conditions which occurred in the state the latter part of the summer. Accidental drowning of young children in stock watering tanks shows an increase. In 1926, 9 such drownings were recorded, but this number jumped to 24 for the year 1927.

The second greatest cause of accidental deaths is the automobile. A compilation of statistics made by the National Automobile Chamber of Commerce shows that more people have been killed by automobiles in the past 8 years than all deaths of American soldiers in the World War. From January 1, 1919, to December 31, 1926, automobiles killed 137,017. Total deaths of the American armed forces during the war were 120,050. Those injured in automobile accidents since the armistice number 3,500,000. Twenty-six per cent of the killed and injured were children under 15 years of age.

From 1914 to 1927, 2,118 deaths have occurred in the state as the result of automobile accidents, 253 of these deaths occurring during the year 1927. There occurred, during the 12-months period, prob-

ably 100,000 automobile accidents. Accidents always result in some damage to the automobile, and frequently death to the driver or occupants, and oftentimes serious injury. According to the National Safety Council, approximately 35 persons are injured for each death resulting from automobile accidents, and on that basis 8,855 would have been injured in Kansas during the past year. Considering automobile accidents from an economic standpoint, we find the loss for 1927, as follows:

8,855 injured at \$175.....	\$1,549,625
Damage to automobiles, 100,000 at \$50.....	5,000,000
253 deaths at \$4,000 *.....	1,012,000
Total.....	<u>\$7,561,625</u>

* In Kansas, \$4,000 is the sum allowed by the Workman's Compensation Act.

It would only seem logical that with an increase in the number of automobiles there would be an increase in the number of deaths. There has been a steady increase in the death rate per 100,000 population, but a decrease per 100,000 automobiles.

Undoubtedly, the general opinion prevails that the majority of deaths result from the collision of automobiles. Such is not true in Kansas. On the basis of reported deaths for 1927, 80, or 31.6 per cent, were pedestrians. By pedestrians are classified generally those who were killed in the street or public highway, and were not occupants of automobiles or other vehicles. Many of the 80 killed were children playing in or crossing the street. Sixty-four deaths, or 25.3 per cent, occurred as the result of an automobile skidding or overturning, many of them perhaps the result of speeding. Fifty-one deaths, or 20.1 per cent, were the result of the collision of automobiles with other motor cars, motor driven trucks or lighter vehicles.

The death rate for automobile accidents has been steadily increasing, there being only 3 years when deaths in Kansas did not show an increase over previous years. As previously stated, these decreases occurred in the years 1919, 1921 and 1924. I am unable to explain the decreases in the years 1919 and 1921, but that in the year 1924 is due to a change in statisticians in the Division of Vital Statistics, and the fact that some accidental deaths were not queried as to their cause.

During the year 1927, 181 deaths, or 71.5 per cent of the total of 253 deaths due to automobile accidents, were recorded as occurring in rural sections of the state.

Deaths resulting from railroad accidents have varied from 101 in 1919 to 151 in each of the years 1916 and 1917. It is rather a

coincidence that in 1914 there were 133 deaths and in 1927, 135 deaths. In 7 of the 14 years from 1914 to 1927, deaths ranged between 132 and 137.

Five and six-tenths per cent of the accidents in the 5-year period 1923-1927 occurred in the month of April, and the highest, 11 per cent, during the month of September. In the remaining 10 months, the percentage varied from 6.8 to 9.1.

Fifty-six of the 156 deaths were reported as the result of the collision of an automobile or motor driven truck with a railroad train at a grade crossing. This number represents 41.1 per cent of the total deaths from railroad accidents. Forty-one, or 73.2 per cent of these deaths, occurred as the result of accidents in rural sections of the state, or in cities and villages of less than 10,000 population. The 56 deaths were caused by 40 accidents—32 accidents resulting in single deaths; 5, each resulting in 2 deaths; 2, each resulting in 3 deaths, and 1 grade crossing accident resulting in 4 deaths.

In 1926, there were 27 grade crossing accidents, causing 41 deaths—17 causing 1 death; 7, each causing 2 deaths; 2, each causing 3 deaths; and 1 resulting in 4 deaths.

In 1927, there were 26 deaths of railroad employes resulting from railroad accidents and representing a total of 19.1 per cent from this cause.

Accidental burns, excepting conflagrations, caused 1,169 deaths. Including conflagrations, the total is 1,461. Thirty-eight per cent of these deaths in 1927 were under 20 years of age, and 39 per cent were over 50. The most common causes of accidental burns were given as starting a fire with kerosene, children playing with matches, clothes catching fire from open gas stoves or grates, and trash and bonfires.

There are a few additional types of accidental deaths that we shall discuss briefly:

Accidental injuries by machines have caused 414 deaths, and injuries by vehicles other than automobiles—trucks or motorcycles—have caused 357 of these. Many of these deaths were the result of runaway teams. It would seem in this day and age of the automobile and tractor that we should have very few of these accidental deaths. Yet, rarely a month passes that the division does not receive one or more certificates reporting this type of accidental death. The majority of these naturally occur in the rural sections of the state.

Accidents of an industrial nature are reportable to the Labor Department of the state, but other than these, the state law does not require reporting. Such data as have been given were secured through queries made of the physicians who have signed the death certificates.

It is only through the willingness of Kansas physicians to coöperate with the department that we have been able to secure the information which we consider so vital to a proper study of accidental deaths.

In the program for good roads in Kansas, the State Highway Engineer has recently advised us that more than 1,000 grade crossings have been eliminated in the past 10 years, the majority of them in the past 3 years.

SUMMARY

1. Accidental deaths cause approximately 6 per cent of total deaths.
2. Accidental deaths have an appreciable effect on the death rate of every community.
3. Five principal types of accidents cause more than 50 per cent of all deaths—the very great majority of these could be prevented if proper precautions were exercised.
4. Deaths from railroad accidents, falls, drownings and burns do not show much variation from year to year.
5. Automobile accidents and resulting deaths are decidedly on the increase.

Institute for the Health of School Children

A DECREE of the Minister of Public Instruction of Chile, dated March 23, 1928, provides for the establishment of an Institute for the Health of School Children, the purpose of which will be to guide the physical and mental development of children during their school life. The institute will consist of two divisions: division of education and division of school hygiene.

The division of education will provide courses in school hygiene for teachers and for the general public and courses to train nurses and home visitors.

The division of school hygiene will be in charge of the medical inspection of school children throughout the country. It will also study matters relating to the physical and mental development of school children and give information to the ministry of public instruction on these matters. Records will be kept of the physical and mental condition of the children throughout their school career.

Free dental and medical treatment will be provided for children whose parents are unable to pay. Laboratories, clinics, and other facilities for carrying out the work of the institute will be maintained by the public authorities.—*Diario Oficial de la Republica de Chile*, Santiago, Apr. 27, 1928, p. 2175.

Hearing Survey Among a Group of Pupils of Syracuse Schools

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THE physical examination of school children presents many problems, not the least of which is the determination of the amount of deafness of the hard-of-hearing child.

The "watch tick" method, upon which many rely, is subject to great variation, depending on the make of watch, amount of noise in the room, understanding of the child as to what is expected of him and his response to the test, and the personal equation of the examiner. The same faults are true also of the "whispered speech" method of examination. Coupled with the above is the necessity of testing each child individually.

Recent surveys of the condition of hearing of school children in the United States seem to indicate that more than 3 million have hearing defects.

The published reports^{1,2,3,4} indicated that the Audiometer recently developed by the Western Electric Company could be depended upon to overcome the objection of the previous methods of examination, even to being able to test at one sitting with a minimum of time and a high degree of accuracy all the children in the usual schoolroom.

It was decided to conduct a survey to determine the amount of deafness in the schools of Syracuse. Eight schools were chosen to give a cross-section of the city. The work began October 15, 1926, and extended to May 31, 1927.

In order to determine the best method of carrying on the work in the future, the survey was made a special study independent of the work of the regular school examinations. The examiner was a physician specializing in ear work. He was assisted by the nurse and a clerk on a part-time basis.

Briefly, the Audiometer may be described as a phonograph from which the voice is transmitted through a magnetic telephone device, then through ear phones to the pupils. The records used resemble those of the ordinary phonograph, numbers only being transmitted in varying degrees of intensity. The range of the voice transmitting the numbers varies from a loud conversational tone to that of a barely audible whisper. One of the records transmits numbers of three

digits, as "526." This one was used in the 6th, 7th and 8th grades. The other record transmits numbers of two digits and was used in the 3d, 4th and 5th grades.

The Audiometer determines ability to hear the normal speaking voice, but does not include the upper limits of hearing. If a pupil, therefore, does not hear the voice of the Audiometer, it does not mean that he is totally deaf but that, as far as ordinary conversation is concerned, his hearing is impaired.

Standard record sheets and rating charts furnished by the Western Electric Company were used in the study. The record sheets used by the pupils for recording what they hear are graded in sensation units lost, ranging from —3 to 30, i.e., —3, 0, 3, 6, 9, 12, and so on up to 30. The —3 represents the highest rate of hearing and 30 the poorest. A child with a hearing loss of 27 or 30 units can hear very little of the normal speaking voice.

In rating the papers the standard advised by the Western Electric Company was used, i.e., that all pupils who could not hear 9 sensation units had impaired hearing. All those who failed on the first test were given a second test. All who failed the retest were given an ear, nose and throat examination to determine the probable cause of loss of hearing.

Schools in which the tests were to be made were selected with the idea of obtaining pupils of varied nationalities and living under different economic conditions. The quietest room available was selected for the tests. In four schools the stage of the auditorium was used; in two the cafeteria; and in the remainder a large classroom.

At the beginning of the survey but one tray of 8 ear phones was available. Later 12 ear phones were used, and about the middle of January, 1927, four additional trays containing 8 ear phones each were used. This made it possible to test 40 pupils (the capacity of the instrument) at one time.

The time used to test 40 pupils varied with the grades. The lower grades required more time than the upper. The minimum time was 10 minutes and the maximum, 45.

Tests were made in eight schools—three public, four parochial and one high school. The high school pupils were tested with the idea of comparing the results with those obtained in the grade schools.

A total of 4,790 pupils were tested—4,419 grade school and 371 high school pupils. Of this number 1,466 grade school and 84 high school pupils were retested. In all 6,711 tests were given with the Audiometer. Four charts were kept for each school, in each case recording the sex and grade:

Chart No. 1. Number tested, retested, number with impaired hearing

Chart No. 2. Number with impaired hearing by degrees

Chart No. 3. Presence or absence of tonsils and adenoids among those with normal and impaired hearing

Chart No. 4. Results of ear, nose and throat examination and recommendations

In this report we consider only the pupils tested in the grade schools, a total of 4,419. Of the 4,419 pupils tested, 502 or 11.3 per cent were found to have impaired hearing. The percentage of impaired hearing found among the boys was 10.6 per cent and among the girls 12 per cent.

The lowest percentage of impaired hearing at all ages, 1.9 per cent, was found at St. John's School where the pupils are mostly Americans and the economic conditions are excellent. The highest percentage of impaired hearing, 17.6 per cent, was found at Franklin School where the pupils are mostly of Italian parentage, and economic conditions are poor.

TABLE I
IMPAIRMENT AND ECONOMIC CONDITION

School	Nationality	Economic Conditions	Registration of Grades Tested	Number Tested	Number with Impaired Hearing	Percentage with Impaired Hearing
Assumption	German American	Fair	411	381	32	8.4
Delaware	American	Good	863	854	76	8.9
Franklin	Italian	Poor	1,125	1,116	197	17.6
Holy Trinity	German American	Good	125	125	5	4.0
Sacred Heart	Polish	Poor	1,071	1,009	118	11.7
St. John's	American	Excellent	316	308	6	1.9
Seymour	American (Mixed)	Poor	650	626	68	10.8
			4,561	4,419	502	11.3

TABLE II
DEGREES OF HEARING LOSS

School	Number Tested	Number with Impaired Hearing	Degree of Loss							
			9	12	15	18	21	24	27	30
Assumption	381	32	22	5	0	2	0	1	0	2
Delaware	854	76	46	13	7	3	0	2	3	2
Franklin	1,116	197	108	61	15	2	3	1	3	4
Holy Trinity	125	5	2	1	0	0	0	1	1	0
Sacred Heart	1,009	118	80	30	6	1	1	0	0	0
St. John's	308	6	2	2	1	1	0	0	0	0
Seymour	626	68	38	11	6	4	4	0	0	5
	4,419	502	298	123	35	13	8	5	7	13
			421		56			25		

421—Borderline of impaired hearing
56—Moderate degree of hearing loss
25—Severe hearing loss

The hearing loss among the 502 pupils found to have impaired hearing seems to be confined to a mild degree of hearing loss, as 421, or 83.8 per cent, had a sensation unit loss of 9 to 12. These may be considered as on the borderline of impaired hearing. Fifty-six, or 11 per cent, had a moderate degree of hearing loss; 25, or 5 per cent, had a severe hearing loss.

According to the 4,419 questionnaires filled in by the pupils given the hearing test, 1,094, or 24.7 per cent, claimed their tonsils and adenoids had been removed; however, upon examination this information proved unreliable. Of the 502 pupils with impaired hearing it was found that 410, or 81.7 per cent, still had tonsils and adenoids.

TABLE III

PUPILS WITH IMPAIRED HEARING WITH TONSILS AND ADENOIDS PRESENT

Grade	Average Age	Number with Impaired Hearing	Number with Tonsils and Adenoids Present	Percentage
3d	8	106	78	73.6
4th	10	130	116	89.2
5th	11	113	94	83.2
6th	12	74	63	85.2
7th	13	42	33	78.6
8th	14	27	20	74.0
Ungraded ¹	12 to 16	10	6	60.0
		502	410	81.7

1. Ungraded class located at Seymour School
Not considered for comparison purposes

We regret that, owing to the fact that work was done in Franklin School between semesters, we were unable to examine for ear, nose and throat defects the 197 pupils found there with impaired hearing, and 3 Assumption School pupils who were absent when the special examination was made.*

The cause of impaired hearing was classified into three general groups as follows: External ear, 54, 17.8 per cent (caused by wax or cerumen in the external canal); middle ear, 227, 75.1 per cent (194 or 85.4 per cent due to chronic catarrhal condition, 33 or 14.6 per cent due to chronic purulent discharge); inner ear, 11, 3.6 per cent; undiagnosed, 10, 3.3 per cent.

Among the 11 pupils with inner ear trouble were 2 with a history of skull fracture and several with a history of other members of the family afflicted with deafness. This group of 11 is considered as afflicted with nerve deafness although about 50 per cent of them had

* The special ear, nose, and throat examination was made under the direction of Dr. Harold G. Kline, consultant for the survey, and Dr. E. P. Hall, whose service aided materially.

FIGURE I

PERCENTAGE OF PUPILS WITH IMPAIRED HEARING WHO WERE FOUND TO HAVE
TONSILS AND ADENOIDS PRESENT

By grade and age

By grade and age

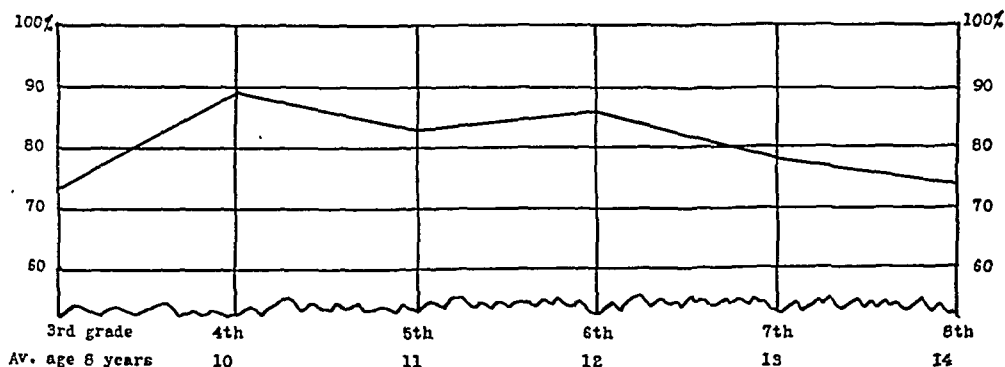


TABLE IV

RESULTS OF SPECIAL EAR, NOSE AND THROAT EXAMINATION OF PUPILS WITH A HEARING LOSS
OF 9 DEGREES AND OVER

	No. of Pupils	Per Cent
Given special ear, nose and throat examination.....	302	
Found to have hypertrophied tonsils.....	201	66.5
Found to have perforated drums.....	21	6.9
Found to have retracted drums.....	142	47.0
Found to have wax.....	54	17.8
Found to have mastoids (operated).....	6	1.9

some middle ear involvement. The 10 cases undiagnosed were recommended for further observation.

In the cases of the 302 pupils who were given the special ear, nose and throat examination recommendations were made as shown in Table V.

TABLE V

RECOMMENDATIONS

Tonsillectomy.....	187
Removal of wax.....	54
Inflation.....	13
Medical attention for purulent discharge.....	33
Further observation.....	15

As a result of this survey we are of the opinion that diseased tonsils and adenoids, causing middle ear catarrh, are mainly responsible for deafness among school pupils. The deafness of 187 pupils, therefore, could have been prevented or materially improved by a tonsillectomy and adenectomy. Ear wax ranks second as a cause of deafness. In this instance the deafness of 54 pupils could be cured by the removal of ear wax.

The condition of 33 pupils suffering from discharging ears could be improved by proper medical attention. In other words, proper

medical attention could restore to normal, or nearly normal, the hearing of approximately 80 per cent of the 302 pupils with impaired hearing.

The groups classified as suffering from inner ear trouble and "undiagnosed" would profit little by medical attention. However, they were referred to their family physician for advice and treatment.

The record of impaired hearing by grade and age shows the highest percentage to have been found in the ungraded class examined at Seymour School. As this class is composed of children who are backward and in some cases not normal mentally, we are not charting it for purposes of comparison.

FIGURE II
PERCENTAGE OF PUPILS WITH IMPAIRED HEARING
By grade and age

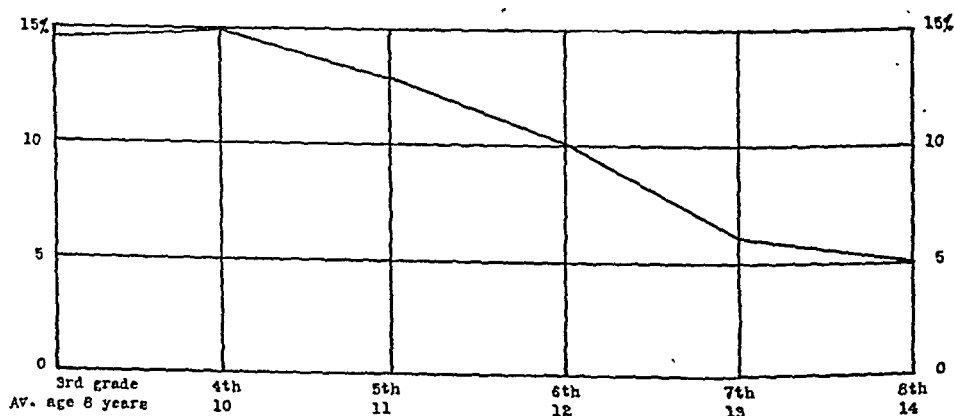


Figure II shows the highest percentage of impaired hearing to have been found in the 4th grades where the average age is 10 years.

TABLE VI
PERCENTAGE WITH IMPAIRED HEARING BY GRADE AND AGE

Grade	Average Age	Number Tested	Number with Impaired Hearing	Percentage with Impaired Hearing
3d	8	721	106	14.7
4th	10	867	130	15.0
5th	11	851	113	13.2
6th	12	725	74	10.2
7th	13	677	42	6.2
8th	14	535	27	5.0
Ungraded	12 to 16	43	10	23.2
		4,419	502	11.3

The accompanying tabulations, showing the high percentage of impaired hearing found in the 3d grade at Franklin School with the subsequent gradual decrease in the higher grades, seem to indicate

that a language handicap might be responsible for inability to understand the Audiometer in the lower grades. The population of Franklin School is over 90 per cent Italian.

TABLE VII
PERCENTAGE OF IMPAIRED HEARING BY GRADE AND SCHOOL

School	Grade..... 3 Average Age.... 8	4 10	5 11	6 12	7 13	8 14	Ungraded
	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent
Assumption.....	5.77	3.80	15.20	14.00	3.57	2.63	
Delaware.....	14.09	9.14	10.70	9.40	6.00	3.70	
Franklin.....	38.18	27.00	22.90	10.43	7.00	3.17	
Holy Trinity.....	4.76	8.33	—	—	5.88	4.54	
Sacred Heart.....	8.80	16.80	6.66	17.90	9.90	9.37	
St. John's.....	2.98	5.66	—	—	—	2.44	
Seymour.....	21.00	6.74	12.90	6.60	5.69	7.79	23.2

Impaired hearing in connection with scholarship was investigated at Delaware School. Results were as follows: Total number pupils tested, 854.

Number with Impaired Hearing	Passed	Failures	Passed on Trial
76	65 (85.5%)	6 (7.9%)	5 (6.6%)
Number with Normal Hearing			
778	653 (84.0%)	42 (5.4%)	83 (10.6%)

CONCLUSIONS

The time required to test 40 pupils varies with the grade. Our minimum time was 10 minutes; the maximum 45 minutes.

Experience will enable us to avoid much of the retesting necessary in this survey.

The impaired hearing amounted to 11.3 per cent of all pupils examined in grade schools—slightly higher among girls (12 per cent) than among boys (10.6 per cent).

The amount of impaired hearing in different schools at all ages varies considerably. The minimum amount found was 1.9; the maximum 17.6 per cent.

The highest per cent of impaired hearing was found in the 4th grade where the average age is 10 years.

We believe a language handicap may influence the result of the examination in the lower grades.

Among the 4,419 pupils examined the findings were as follows:

88.6 per cent with normal hearing
9.6 per cent with hearing loss of 9-12 sensation units
1.2 per cent with moderate degree of hearing loss
0.6 per cent with severe degree of hearing loss

Among the pupils requiring special examination it was found that the cause of the impaired hearing was located as follows:

In external ear.....	17.8 per cent
In middle ear.....	75.1 per cent
In inner ear.....	3.6 per cent
Undiagnosed.....	3.3 per cent

Among these pupils 66.5 per cent had hypertrophied tonsils. We believe, therefore, that diseased tonsils and adenoids causing middle ear catarrh are mainly responsible for deafness among school pupils.

Proper medical attention could be expected to restore to normal or nearly normal 80 per cent of the pupils with impaired hearing.

RECOMMENDATIONS

We believe that the examination can be successfully carried on by a nurse properly instructed.

The examinations throughout the city should be given by the same individual in order that the results may be uniform.

All pupils found with a hearing loss of greater than 9 sensation units should be retested.

After retesting any pupils found with a loss of greater than 9 sensation units should be referred to the aurist for further examination.

We would recommend the employment of:

One aurist, part-time, to have supervision and direction of the work; to instruct the nurses in the use of the Audiometer; to give such examinations as are necessary to determine the amount and cause of deafness in those found by previous examination and to determine those who are to be recommended for treatment at dispensary or by their private physician.

One nurse, who shall receive special training in the use of the Audiometer and conduct the preliminary examinations in all the schools. Her salary shall be paid partly by the school board and partly by the health department, so that all the pupils in the city may have the benefit of the examination. She shall report directly to the aurist the results of her examinations.

Our experience and that of others who have carried on similar studies prompts us to recommend that all pupils in the public and parochial schools, not previously examined in each school system, shall be tested by the Audiometer and that thereafter routine examinations for hearing by this method shall be given to all pupils in the third grades each year.

All pupils needing medical care and attention shall be referred to the school nurse for follow-up with definite instructions from the aurist as to whether the child is expected to visit the family physician or be taken to the dispensary.

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2. Fowler and Fletcher. *J. A. M. A.*, Dec., 1926.
3. Fletcher, Harry. *Bulletin*, New York League of Hard of Hearing, Sept., 1926.
4. Newhart, Horace. *J. A. M. A.*, Sept., 1926.

NOTE: See October JOURNAL for "Vision Survey among a Group of Pupils of Syracuse Schools," by Harry H. Levy, M.D.

Some Factors Influencing the Germicidal Efficiency of Alkalies

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BOTTLE washing machinery has long been employed in the carbonated beverage industry, and this mechanical method is rapidly displacing steam sterilization of bottles in the milk plant. In conjunction with bottle washing machines, various chemical solutions are employed. These so-called washing compounds generally consist of caustic soda, sodium carbonate or bicarbonate, trisodium phosphate, sodium silicate, or various mixtures of these alkalies. In some compounds soap or other colloidal substances are also present.

These washing compounds function in two ways: (1) as detergents or cleansing solutions, and (2) as germicides or sterilizing agents. Extravagant claims are sometimes made for the efficiency of the numerous compounds on the market, but there is a lack of knowledge as to the actual cleansing or germicidal powers of these compounds. A dependable method for evaluating quantitatively the relative cleansing or detergent powers of alkaline washing compounds is not as yet available, but their relative germicidal efficiencies may be readily ascertained.

In a number of states and cities, the sanitary regulations specify minimums for temperature, time of exposure, and strength of detergent solutions. A very common requirement, for example, is a temperature of 52° C. for 10 minutes, with 3 per cent alkali calculated as sodium hydroxide. Obviously if 3 per cent alkali gives a satisfactory result at 52° C., in 10 minutes, a shorter period of exposure, or a weaker solution, may be equally or even more efficient at a higher temperature. Then there is the question of the determination of alkali strength. Normal solutions of sodium hydroxide, sodium carbonate and trisodium phosphate (methyl orange titration) are all 4 per cent alkali calculated as sodium hydroxide, but their germicidal powers are very markedly different.

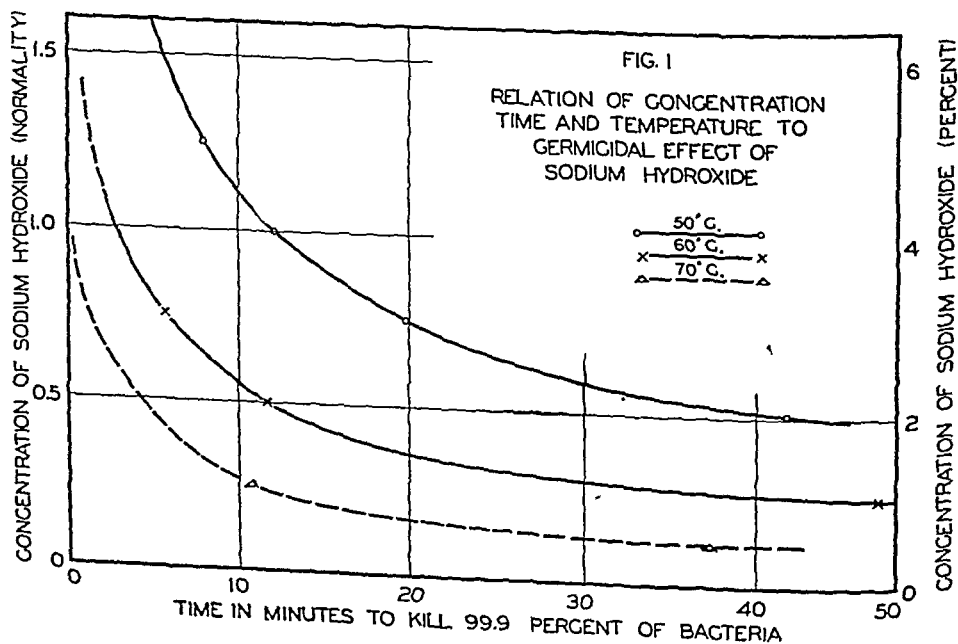
Period of exposure, temperature, concentration, and composition of detergent solutions are important factors, affecting germicidal prop-

erties. A satisfactory and reasonable standard should take these factors into consideration; it should be flexible as respects the interrelations existing between these factors and sterilizing efficiency. Obviously such flexibility cannot be introduced until the relation of composition, concentration, and temperature, to bactericidal powers, are ascertained. It is the purpose of this paper to present a summary of experiments designed to throw some light on these points. For details of the method of preparation of the test culture and technic of the disinfection tests the reader is referred to a previously published paper.¹

A. EFFECT OF TEMPERATURE AND CONCENTRATION OF NaOH

It was the original intention to ascertain "death rates" at various concentrations and temperatures, but this line of attack had to be abandoned in favor of the "death time," for the rates of death were not constant throughout the course of an experiment but progressively increased with the period of exposure. Thus, employing 3 per cent sodium hydroxide at 50°C ., it was observed that about 41 per cent of the exposed dried spores were killed in the first 6 minutes; of those remaining, 55 per cent died during the second 6-minute interval, while 94 per cent of those still surviving succumbed in the third 6-minute period of exposure to the action of the alkali.

The results of numerous experiments with various concentrations of alkali ($\frac{1}{4}$ to 5 per cent) at temperatures of 50° , 60° or 70°C ., in-



variably showed this increasing "death rate" with progressive periods of exposure.

It appears that there are at least two phases in the killing of bacteria with alkali—penetration of the lethal agent into the cell and the germicidal action of the absorbed alkali. The rates of decrease in bacteria resulting from these reactions did not simulate the well known monomolecular reactions; so "death rates" could not be satisfactorily employed in these studies. On the other hand, the time required to effect reductions of 99.9 per cent of the exposed bacteria, which may be designated "death or killing times," is readily determinable and appears to be much more suitable for comparative purposes.

The observed "killing times" with various concentrations of alkali and at different temperatures are summarized in Table I, and shown graphically in Figure I. As only two points were available at 70° C., the curve for this temperature is indicated by a broken line to designate its tentative character. From these curves the effect of change in concentration of sodium hydroxide or temperature of exposure to the "killing time" may be readily ascertained.

TABLE I

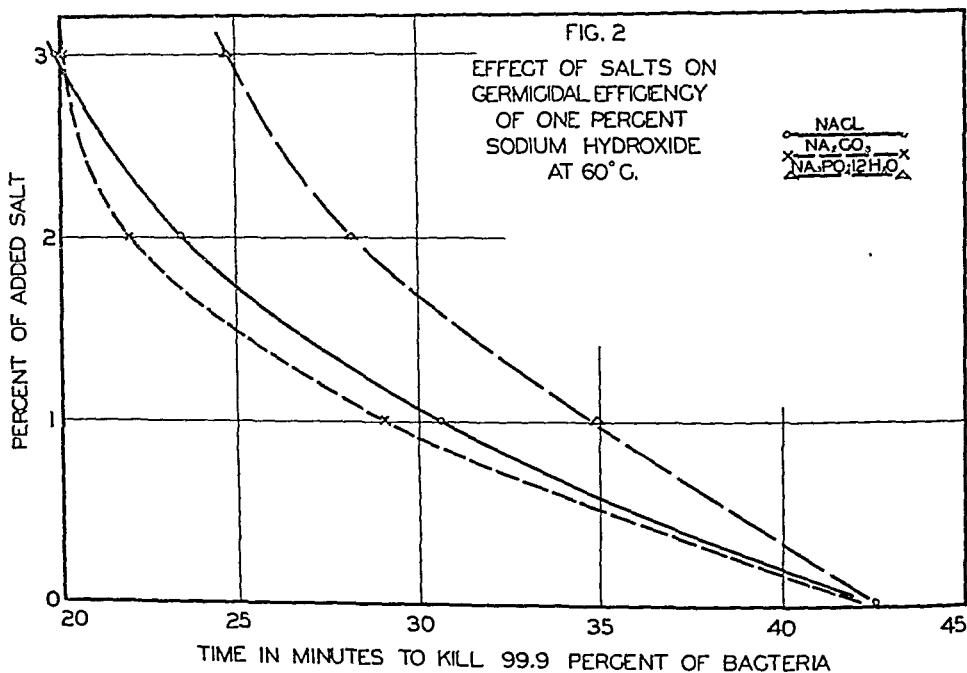
RELATION OF CONCENTRATION OF NaOH AND TEMPERATURE TO TIME FOR EFFECTING REDUCTIONS OF 99.9 PER CENT OF DRIED BACTERIAL SPORES

Temperature Conc. of NaOH	50° C.	60° C. Killing Time in Minutes	70° C.
0.1215 N.	—	—	37.4
0.25 N.	—	46.8	10.7
0.50 N.	41.7	11.7	
0.75 N.	19.8	5.7	
1.0 N.	12.4		
1.25 N.	8.2		

B. EFFECT OF ADDITION OF SALTS ON GERMICIDAL ACTION OF NaOH

A large series of observations on the influence of sodium chloride, sodium carbonate and trisodium phosphate on the germicidal powers of sodium hydroxide has been reported elsewhere.² These studies showed that the salts, when acting alone, had very little killing power on the dried spores of the test organism at 60° C., but when added to caustic soda the sterilizing efficiency of the latter was markedly increased, as may be seen from the summary presented in Table II. The phosphate was not so effective as the chloride or carbonate on a simple weight basis, but if comparisons are made on the basis of the quantity of sodium added, the phosphate would be found more effective than the carbonate and chloride, which are about equal.

Considering the fact that these salts showed but slight germicidal properties at 60° C. when acting by themselves, their marked effects



are attributed to their influence on the hydroxide. The presence of sodium chloride, carbonate and phosphate enhances the germicidal properties of sodium hydroxide. No appreciable changes in pH of 1.0 per cent sodium hydroxide were observed on addition of the salts studied. It is suggested that the increased sterilizing action is due to an increase in undissociated sodium hydroxide which penetrates the cell, or to a decreased water solubility (change in partition coefficient) of the hydroxide which is forced into the bacterial phase of the water-bacteria mixture.

TABLE II
EFFECT OF SALTS ON GERMICIDAL EFFICIENCY OF NaOH AT 60° C.

Alkali	Killing Time in Minutes
1% NaOH	42.5
1% NaOH + 1% NaCl	30.6
1% NaOH + 2% NaCl	23.4
1% NaOH + 3% NaCl	19.9
1% NaOH + 1% Na_2CO_3	29.0
1% NaOH + 2% Na_2CO_3	21.9
1% NaOH + 3% Na_2CO_3	20.1
1% NaOH + 1% $\text{Na}_3\text{PO}_4 \cdot 12\text{H}_2\text{O}$	34.9
1% NaOH + 2% $\text{Na}_3\text{PO}_4 \cdot 12\text{H}_2\text{O}$	28.1
1% NaOH + 3% $\text{Na}_3\text{PO}_4 \cdot 12\text{H}_2\text{O}$	24.7

If the killing times in Table II are plotted against the per cent of added salts, curves are obtained (see Figure II) from which the effects

of these salts on the germicidal properties of 1.0 per cent sodium hydroxide at 60° C. may be read off.

C. RELATION OF NORMALITY AND pH TO GERMICIDAL EFFICIENCY OF ALKALIES

For the purposes of control of alkali detergent solutions, it is essential to have some simple but adequate method available for the plant operator. It was formerly customary to employ the hydrometer or specific gravity of the solution. This is obviously not dependable either as a measure of alkalinity, detergency, or germicidal efficiency, for in the course of a day's operation, the specific gravity might actually increase, due to the accumulation of soluble salts from the washed bottles, while the actual alkali content, and consequently the detergent and germicidal properties of the solution, would decrease because of the neutralizing substances removed from the bottles. The hydrometer is gradually being replaced by alkalinity (expressed as per cent caustic soda) determinations and it has more recently been suggested that the pH might serve as an index.

A few observations on the comparative germicidal efficiencies of alkalies of the same normality as well as at the same pH are given below.

1. *Comparison of different alkalies at the same normality*—It was found necessary to employ a temperature of 70° C. in order to effect a reduction of 99.9 per cent of the exposed bacteria with a normal solution of sodium carbonate,* within a reasonable time. At this temperature, the killing times determined for normal solutions of sodium carbonate and trisodium phosphate were 118 and 5 minutes respectively, while that for a normal sodium hydroxide solution was estimated from Figure I at about 0.6 minute. The pH (expressed as at 30° C.) of these normal solutions were 11.35, 12.15 and 13.43 for the carbonate, phosphate, and hydroxide, and the corresponding concentrations by weight were 5.3, 19.0 and 4.0 per cent.

It is evident that titrable alkalinity (expressed as per cent caustic soda) is not a direct measure of germicidal efficiency of different alkalies. At first thought, it might appear that the pH value would be a preferable index, as the alkali with the highest pH was most efficient, but a study of the germicidal efficiencies of different alkalies at the same pH shows distinctly that this determination is also unsatisfactory.

2. *Comparison of different alkalies at the same pH*—In Table III are shown the periods required to kill 99.9 per cent of the exposed

* All titrations made with methyl orange.

bacteria at 70° C., employing different alkalis at the same pH. It will be observed that there is no direct relation between the pH and killing times for different alkalis.* Thus trisodium phosphate was not only much more efficient than sodium hydroxide at the same pH (pH 12.15), but it was also a much better germicide than sodium hydroxide at a distinctly higher hydroxyl ion concentration (pH 13.0).

TABLE III

RELATION OF pH TO GERMICIDAL EFFICIENCY OF DIFFERENT ALKALIES AT 70° C.

pH	Alkali	Killing Time
11.35	Na ₂ CO ₃	118 minutes
11.35	Na ₃ PO ₄ ·12H ₂ O	163 minutes
11.35	NaOH	220 minutes
12.15	NaOH	36 minutes
12.15	Na ₃ PO ₄ ·12H ₂ O	5 minutes
13.0	NaOH	12 minutes
13.0	Commercial alkali	6.3 minutes

At a given hydroxyl ion concentration, sodium carbonate was most efficient, followed by the phosphate and hydroxide. This is just the reverse order from that which was observed when comparing these alkalis on a normality basis.

For a given alkali, the germicidal properties increase with concentration on both the normality or hydroxyl ion basis, but neither of these indices is a direct measure of the relative disinfecting efficiencies when comparing different alkalis.

D. ON THE CHOICE OF AN INDEX FOR THE CONTROL OF ALKALINE BOTTLE WASHING SOLUTIONS

The ideal index would be one which bears a direct relation to the detergent and germicidal powers of all compounds used in bottle washing and which may be easily determined with a reasonable degree of reliability by the plant operator. In the selection of an index, consideration should also be given to the nature and composition of washing compounds generally employed. In view of the lack of suitable and accepted methods for quantitatively estimating detergent properties, the choice of an index must be made, at least for the present, on the basis of relation to germicidal properties and reliability of determination. The hydrometer or specific gravity, the pH, and the titrable alkalinity (expressed as caustic soda) have either been employed or suggested as indices.

The objections to the hydrometer test have already been stated. The specific gravity of a cleaning solution may remain constant or even increase simultaneously with a reduction of alkalinity due to accumulation of neutralizing substances, so that this index is unsuitable.

The pH is too delicate an index for satisfactory use in the hands of the plant operator. Considering sodium hydroxide, it will be observed from Figure I that the "killing times" for 1 and 3 per cent solutions at 60° C. were about 47 minutes and 6 minutes, and their reactions were pH 12.99 and pH 13.32 respectively. A difference of 0.33 in pH was accompanied by a variation of about 800 per cent in "killing time." The determination of pH in the vicinity of pH 13 is very difficult. With carefully calibrated instruments and pure solutions variations of 0.1 were not uncommon for trained observers. An error of probably not less than pH 0.2 would have to be expected if colorimetric methods were to be employed by the plant operator, with turbid and colored solutions. Such an error would be equivalent to 2 per cent sodium hydroxide or about 400 per cent in anticipated killing time. The titrable alkalinity would be subject to less error in the hands of the operator.

Most washing compounds consist of mixtures of sodium hydroxide with carbonate or phosphate. In Figure II it is shown that the "killing time" decreased as the quantity of carbonate or phosphate added to the hydroxide increased, but the pH of the mixtures remained constant, as far as was determinable. The titrable alkalinity increased with added carbonates and phosphates and was therefore better correlated with germicidal efficiency than the pH of the mixtures employed.

It appears, therefore, that for washing compounds and concentrations actually employed, the alkalinity expressed as sodium hydroxide is, at present, a more suitable and reliable index of germicidal efficiency than pH, although it is not the ideal index. The determination of the free caustic as well as total alkalinity is essential for evaluating the germicidal properties of washing solutions.

With the aid of Figures I and II it is possible to develop sterilizing efficiency tables for hydroxide carbonate and hydroxide phosphate mixtures at 60° C., in terms of sodium hydroxide, on a titration basis, but this cannot be done on a pH basis.

SUMMARY

1. A technic is reported for ascertaining the relative germicidal efficiencies of strong or concentrated alkalies.
2. The exposed bacteria did not die off at a constant rate, but on the contrary, the death rates increased with the periods of exposure. These rates are therefore considered unsatisfactory for comparative purposes.
3. The "killing time" for 99.9 per cent of the exposed bacteria is considered a suitable, determinable, and desirable criterion of the relative germicidal efficiencies of the alkali solutions studied.

4. For a given alkali, the germicidal efficiency increases with its normality and hydroxyl ion concentration, but neither of these determinations can be considered a suitable index of the comparative sterilizing powers of different alkalies.

5. At the same normality, the alkalies rank in the order: (1) sodium hydroxide, (2) trisodium phosphate, and (3) sodium carbonate with respect to sterilizing efficiency.

6. At the same hydroxyl ion concentration (pH) the order of sterilizing efficiency is reversed, namely, (1) sodium carbonate, (2) trisodium phosphate, and (3) sodium hydroxide.

7. The addition of sodium chloride, sodium carbonate, or trisodium phosphate to sodium hydroxide markedly reduced the "killing time," though it did not measurably affect the pH of the caustic solution.

8. The germicidal efficiency of alkalies is not a direct function of the hydroxyl ion concentration but is affected markedly by other factors.

9. The undissociated sodium hydroxide may be the controlling factor in the germicidal powers of alkalies.

10. Considering the washing compounds as actually employed (sodium hydroxide and mixtures of the hydroxide with carbonate or phosphate), the alkalinity expressed as caustic soda (normality) is a more suitable and reliable index than the pH value.

11. Curves are presented showing the relation of temperature and concentration to germicidal efficiency of sodium hydroxide, and the effect of the presence of sodium chloride, carbonate and phosphate on this efficiency.

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NOTE: These studies were made possible through the establishment of an Industrial Fellowship at the Iowa State College, by the American Bottlers of Carbonated Beverages.

Supervision of Milk Supply in Cuba

A DECREE establishing a special government bureau for supervision of the milk supply throughout Cuba has been signed by the President. Detailed regulations on this subject have been prepared by a special committee and will be submitted to the President for his signature. The decree orders that the next budget include an appropriation for carrying out this work.—*El Mundo*, Habana, July 2, 1928, p. 1.

A Publicity Campaign of National Scope*

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SEVERAL years' experience in conducting the Christmas Seal sale has taught tuberculosis associations a successful technic of organized publicity. While the seal sale undoubtedly has some educational value, its primary purpose is to raise funds. In 1928, tuberculosis associations of the United States agreed to unite in a nation-wide publicity campaign which should have for its sole objective the education of the public in at least one important principle of tuberculosis prevention.

In planning the campaign, it was early recognized that, whatever the message, it must be simple and concrete. After careful consideration of some twenty suggestions, it was decided to select as the central theme the importance of discovering tuberculosis in its early stages. This concept was built around the slogan, "You May Have Tuberculosis," with the emphasis on "You," followed by the specific appeal to "Let Your Doctor Decide." The slogan was supplemented in most of the publicity material by a list of danger signs; namely, Too easily tired, Loss of weight, Indigestion, Cough that hangs on: a list of symptoms selected by a number of clinicians whose opinions had been sought. The message was to be addressed primarily to adults. The ultimate objective was to acquaint everyone with the danger signs of tuberculosis; to motivate all who were in doubt about their health to seek medical advice; and to bring to the attention of the medical profession the importance of discovering the disease in its early stages. There is nothing new in this idea, but by concentrating on it for a brief but definite period, it was hoped that the cumulative effect of past educational efforts might be crystallized.

The publicity committee which sponsored the slogan was not blind to the fact that its appeal was one of fear, a motive which has of late fallen into disrepute. (More properly it might be maintained that the appeal was one of cautiousness.) It also considered frankly the criticism that the listing of symptoms savored of quackery; but con-

* Report of the Early Diagnosis Campaign Conducted by Tuberculosis Associations.

cluded that the questionable end achieved by the quack did not necessarily condemn the means. The committee recognized, too, that the message emblazoned on broadside and billboard might arouse much needless apprehension and thus sow the seeds of neurasthenia, where it had hoped to scotch tuberculosis. But against these several objections was weighed the obstinate fact that today, after some two decades of continuous propaganda, the majority of patients who are diagnosed as tuberculous come to the doctor for the first time only after the disease is well advanced, the grave significance of which is apparent to the public health worker as it is to the medical practitioner. Therefore, a message with an elemental appeal, directed straight at the reader, including a frank listing of danger signs and the direct advice to seek medical aid, seemed justified.

March, 1928, was selected as the month when the campaign was to be carried on. Practically all state and affiliated tuberculosis associations agreed to participate according to their abilities, and the National Tuberculosis Association assumed the responsibility of leadership. The material created for the purpose included the following:

- A poster designed by Ernest Hamlin Baker, showing a physician examining a patient with bared chest. This was used also as a posterette, car card and window display.

- A 24-sheet billboard designed by F. G. Cooper, featuring the slogan and the double-barred cross, and listing the symptoms.

- A 4-page circular containing brief information and descriptions of the early symptoms.

- A 6-page folder for physicians, entitled "An Appeal to the Medical Profession."

- Newspaper articles, including feature stories and illustrations.

- Special articles on early diagnosis, written by well-known clinicians, offered for publication to medical and public health journals.

- Two motion pictures, one for lay audiences called "Delay is Dangerous"; another for medical groups, "The Doctor Decides."

- Electrotypes for use in newspapers, house organs and magazines.

- For the guidance of secretaries of tuberculosis associations, a special manual of instructions for securing publicity was printed, while a mimeographed periodical called "Diagnostigrams" helped to exchange ideas and to feed the fires of enthusiasm.

Roughly, the National Association invested about \$68,860 in the campaign, of which about \$30,000 was returned in the form of purchases from its affiliated associations. This figure includes the production cost of certain materials, such as motion pictures, and the art work for posters, which together exceeded \$24,000. The National Association gave free to its affiliated associations material valued at several thousand dollars and distributed independently almost \$1,000 worth of printed matter.

State and local associations also produced much of their own material, gave lectures and radio talks, arranged for motion picture showings, and furnished newspaper copy. Commercial organizations, fraternities, societies and insurance companies entered into the spirit of the campaign, some printing their own material or carrying publicity through their magazines, others distributing the material furnished by the tuberculosis society. The Metropolitan Life Insurance Company devoted its expensive and widely read advertising page during the month of March to the early diagnosis of tuberculosis.

Equally important as the effectiveness and persuadability of the publicity matter is the manner in which it is distributed and used. It soon became evident that some associations entered into the campaign with vigorous spirit, while a few merely drifted or were pulled along by the current. To gauge the effectiveness of a publicity effort by a measure of the materials produced, even if that were possible, would be misleading, for the effort necessary to make the publicity material "work" cannot be measured. As a very rough index, however, of the enterprise of associations, a tabulation was made, showing the amount of material furnished to each state. When the supplies purchased by states were reduced to a per capita figure, it was found that the largest amount of publicity material purchased by any one state was equal to \$2.14 per 1,000 population, while the state at the bottom of the list purchased \$.08 worth of material per 1,000 population. The average value of material secured from the National Association by the 54 state and affiliated associations on a per capita basis of 1,000 was \$.332. This figure represents only the bare cost of material and, since only a wild guess is possible, may legitimately be multiplied by three in order to estimate the total cost, including overhead, of the campaign; which in that case would be equivalent to \$1.00 per 1,000 population, or one mill per person.

Newspaper clippings which deluged the office shortly after the campaign opened gave some indication of the vast amount of publicity on tuberculosis which appeared throughout the country. Some associations measured the newspaper space secured. Michigan, for example, reported 529 columns; New Jersey 189; Indiana 100; Minnesota 100; West Virginia 88; St. Louis 500 columns; to mention but a few.

The motion pictures were distinctly successful. Of the film for lay audiences 214 copies were sold. In many cities the film was used as part of the regular program of motion picture theatres. Some characteristic comments abstracted from the reports are these: Booked solid until April 16—Shown in 10 of the leading theatres—Shown in

30 schools, 50 factories and 14 other groups—Very popular especially in commercial houses—Booked solidly to beginning of May—State Board of Health is to show "Delay is Dangerous" in every county of state. The film for medical audiences was equally well received and provided an excellent opportunity for tuberculosis associations to co-operate with medical societies. Incidentally one of the valuable by-products of the campaign is that it has given associations a chance to join hands with the medical profession. The film was not intended, of course, to teach doctors how to make a diagnosis but it did open the door for further discussion and where an actual demonstration of how to make a thorough physical examination was combined with a film showing, the effect was a happy and a valuable one.

Another rough index for measuring the effort and the results of the campaign was derived from reports made to the National Association by its affiliated associations on clinic attendance. These do not lend themselves to tabulation which would have exact statistical value, but a hasty sampling indicates that in one respect at least the publicity hit its target. "Let Your Doctor Decide" was the specific advice emphasized. The severest test that might be applied was, how many, if any, persons actually visited the doctor as a direct result of the educational campaign. A complete answer cannot, of course, be given; but every association that reported mentioned that a decided increase in clinic attendance had been noted. A few quotations are these:

Clinics reported an increase in attendance over last year in March of 30 per cent.

Business of health center increased.

Clinics overcrowded and new clinics started in rural schools.

Material increase in clinics, necessitating holding of special clinics.

Created waiting list for county sanatorium.

Clinic attendance exceeded expectations, resulting in discovery of 15 active cases.

Clinic attendance for month is 40 per cent higher than for March, 1927, and is 16 per cent higher than it has ever been.

Discovery of largest number of early and curable cases of tuberculosis in the history of the work of the association during a one-month period.

New tuberculosis patients doubled in March.

Since the educational message included the direct advice to consult the doctor, an attempt was made to learn what, in general, the medical profession thought of the campaign and whether or not they had noticed an increase in the number of private patients who consulted them about tuberculosis. Opinions which had been gleaned here and there from representative medical men were nearly all favorable. To secure more specific information, letters were written to the several hundred physicians identified with the tuberculosis movement through-

out the country. After eliminating from the replies those that were unsatisfactory, for such reasons as that the writer was not in practice or did not treat tuberculosis, there remained about 200 letters which expressed definite opinions or furnished concrete information. All but 2 replies were distinctly favorable and most of them strongly endorsed the campaign. About 50 stated that there had been an increase of private patients asking advice about tuberculosis, while about 30 noted no increase in patients. Twenty-four replies furnished figures showing an increase in clinic patients and 14 demonstrated an increase in sanatorium admissions.

Here are a few characteristic quotations from the letters from physicians:

The campaign has been of value in the early recognition of tuberculosis.

By far the best thing that has ever been done in this place by the local tuberculosis society.

Your Early Diagnosis Campaign has real value, particularly in bringing early cases of tuberculosis to us.

The campaign in Indiana has had a very marked effect and should be carried on again.

The bringing together of physicians and different groups was the best single result of the campaign.

This campaign has really done an immense amount of good.

While comments about the campaign were almost universally favorable, some unfavorable opinions were voiced in scattered places by the press and otherwise. These may be summarized as follows:

1. That the appeal, particularly the appeal to fear, was objectionable. (Sometimes a shock is necessary to stir people out of their lethargy. The second part of the slogan "Let Your Doctor Decide" suggested how the fear of tuberculosis might be brought out into the open and removed if it were groundless.)

2. That doctors generally were not able to diagnose tuberculosis when cases were sent to them. (Like most generalizations, this is an unfair one. Through medical articles, a motion picture and special publications, opportunity was given doctors to review and increase their knowledge about tuberculosis.)

3. That tuberculosis associations, by advocating the slogan, "Let Your Doctor Decide," became nothing more or less than press agents for the medical profession. ("Press agents" is a hard word—but let it pass. What sounder advice could be given one in doubt about his health than to consult a physician?)

4. That the advertising of symptoms is bad psychology and also that it is too closely imitative of quackery and patent medicine methods. (That the giving of specific information is bad psychology is open to question; that it does tend to lead to action is not. Because the quack uses certain methods to attract customers does not necessarily condemn the methods.)

5. That the bared chest of the man in the Baker poster is indecent and not proper for showing before mixed audiences of boys and girls. (Life is too short to answer this objection seriously. Emphasizing the bared chest was of immense value in driving home the idea that a good physical examination cannot be made through a coat and vest.)

Worthy of careful consideration was a friendly criticism made by several representatives of health associations which promote some particular phase of public health other than tuberculosis and by spokesmen for the medical profession. It was to the effect that tuberculosis should not be emphasized to the exclusion of all else. A patient should not be examined with the set purpose of turning up some one particular disease or condition, but to discover whatever pathology may exist, or, better still, to sum up the health capital of the examinee. In other words, the periodic health examination should have been urged rather than a search for tuberculosis.

This is a pertinent criticism. It may be answered in part by submitting that most general practitioners are not yet sufficiently interested in health in the abstract to encourage periodic health examinations. The physician of today is interested primarily in pathology and regards health as something to be recovered rather than to be achieved and maintained. Probably more progress will be made if doctors approach the patient from the point of view of some definite disease or pathology, such as tuberculosis. By gradually broadening the emphasis, doctors may in time become interested in examining the entire body, not with some definite pathology in mind as the target but for the purpose of evaluating the health capital of the examinee. The present campaign was a mere start. If continued year by year, it is possible that the educational campaign may become broadened in scope and power and finally resolve itself into a vigorous periodic health examination campaign.

The Early Diagnosis Campaign carried on by tuberculosis associations in 1928 may be deemed a success because:

1. Every state tuberculosis association coöperated.
2. Pertinent facts about tuberculosis were widely spread.
3. Many persons were persuaded to consult the doctor; clinic attendance and sanatorium admissions were increased.
4. Public health (volunteer and official) and medical groups united in the pursuit of a common objective.
5. The way was paved for more publicity.

Tuberculosis associations are planning another educational campaign for 1929. At least one objection of this year's campaign, it is believed, will be met by the new slogan: **Tuberculosis—Early Discovery, Early Recovery** (list of symptoms)—**Let Your Doctor Decide**. This message is broader, more hopeful, of a more positive appeal, and lends itself well to pictorial expression.

The Carbon Monoxide Hazard in City Streets*

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A REPORT of a new form of homicide recently made its appearance in the public press. It was reported that the victim was bound and placed near the exhaust pipe of an automobile so that he was forced to inhale the poisonous fumes of the running motor. Possibly this novel method of destruction of human life was suggested by the all too frequent reports of deaths from carbon monoxide poisoning due to operating automobile motors in closed garages.

It is perhaps inevitable that the increase in the number of vehicles using internal combustion motors upon city streets should contribute more and more to air pollution, unless some revolutionary change in motor design is made.

As the buildings increase in height, the population going to and from them likewise increases, necessitating greater transportation facilities, including motor driven vehicles which further contribute to air contamination. The number of persons regularly exposed to the effect of engine exhaust gases is also greater.

The careful studies being made, such as that for the ventilation of the Holland Vehicular Tunnel under the Hudson River, indicate that responsible officials are alive to the potential danger of the present situation. Such a realization, however, has not yet come to the public generally. A single motor car which is throwing out a cloud of visible and malodorous fumes of burning oil is more often the subject of complaint to the health department than are a thousand normally operated cars on the same street, although the combined effect of the latter may be far more injurious to health than the former. This is not surprising, in view of the fact that carbon monoxide, the deadly component of exhaust gases, is not evident to sight, taste nor sense of smell. If carbon monoxide had an offensive odor there would be far

*Read before the Public Health Engineering Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 15, 1928.

fewer deaths from it, as people would open their windows or install ventilation systems to get rid of it.

During the three years, 1925 to 1927, inclusive, 133 deaths occurred in Chicago from carbon monoxide poisoning. It is a proper function of a health department not only to prevent needless and premature deaths, but also to prevent non-fatal illness and sickness. Such minor illness may not necessarily keep a man from his work but nevertheless impairs his productivity and usefulness. Acting upon this principle, the Bureau of Laboratories and Research, and the Bureau of Sanitary Engineering of the Chicago Department of Health, in 1926, 1927, and 1928, undertook a comprehensive study of air pollution by carbon monoxide in the streets of the city, under the direction of the Commissioner of Health.

A review of the literature established the fact that definite symptoms of carbon monoxide poisoning may occur from long exposure to low concentrations of the gas as well as from a brief exposure to high concentrations.

Sayers and Yant¹ aver that when a given blood saturation has been acquired by long exposure to low concentrations of carbon monoxide, the symptoms and after effects are more severe than when that same saturation is the result of a short exposure to a higher concentration.

The former type of poisoning, though not acute, gives rise to dizziness, headache, lassitude, nausea and similar symptoms, while the latter or acute type is likely to be immediately fatal.

There is a great variation in individual tolerance to chronic poisoning by carbon monoxide, children being more susceptible to such poisoning than adults, and women apparently are more susceptible than men.² An illustration of differing individual susceptibility is reported by A. M. Stevens, M.D.³ A 7-weeks-old baby died of carbon monoxide poisoning, having a saturation in the blood of 18 per cent. In the baby's bedroom a small leak was found in a gas fixture. The mother who had been in the room almost constantly was poisoned only enough to suffer from headache.

In large cities many susceptible girls are employed for seven to eight hours a day in the atmosphere of the street level, in positions as salesgirls, stenographers, waitresses and in similar capacities. Even their lunch periods are usually spent in the same kind of air. Obviously, constant pollution of the air with carbon monoxide of sufficient concentration will tend to reduce their chances of having robust health, and vigorous vitality, even though definite symptoms of poisoning may not be recognized. Men similarly exposed for hours at a time, as in the case of traffic policemen, have been found to

show a high content of carbon monoxide in the blood. Wilson, Gates, Owen, and Dawson⁴ report the blood findings of 14 policemen, after 8 hours of traffic duty in Philadelphia. Six of the 14 showed an absorption of carbon monoxide of between 20 and 30 per cent of saturation—more than the amount that caused the death of the baby previously referred to. Although death of male adults does not usually occur until a blood saturation of 60 to 70 per cent is reached,⁵ the 20 to 30 per cent found in the blood of these traffic policemen is sufficient to cause headache, dilation of cutaneous blood vessels, throbbing in the temples and, in some individuals of low tolerance, weakness, dizziness, visual disturbances and nausea.

Having these facts in mind, the Commissioner of Health initiated arrangements for a survey of the air of the streets of typical districts of Chicago, and 690 street air samples in all were collected in the survey. Some of the streets selected for sampling were carlines, avoided by automobile traffic; others were automobile boulevards from which heavy and slow moving traffic was excluded; some were in residential sections; some in manufacturing and industrial regions; and still others in the downtown area, locally known as the loop. Sometimes the air samples were taken at the corners of intersecting streets, to get the effect of traffic from both directions, and others were collected midway between. In other words, an effort was made to get a cross-section of the city streets and to avoid concentrating upon any one type of street or area.

The samples were collected at the curb instead of in the middle of the street, because the greater number of the people exposed are upon the sidewalks and in the adjacent offices and stores. Taxicab drivers, streetcar men and others engaged in similar pursuits which require them to spend many hours in the middle of the street form but a small proportion of the total population to be considered.

For purposes of uniformity, samples were collected at a level of three feet above the sidewalk. This is a convenient height for sampling and also is near the breathing zone of children, who constitute the most susceptible age group. Of course, many variables were inevitably present, such as temperature, humidity, wind velocity, and direction as well as variations in the amount and kind of traffic passing at the time of sampling. Observations of these uncontrolled variables were recorded whenever a sample of air was taken, as an aid in correlating the data. No attention was paid to other than automobile traffic. The number of automobiles passing during five minutes was recorded, together with the other observations, upon a special form prepared for the purpose.

Of the 690 samples, 41 were collected upon the lower level of Wacker Drive, a two-level street along the Chicago River. The remaining 649 samples were all taken on streets without overhead obstruction.

METHOD OF EXAMINATION OF SAMPLES

The air samples were collected by displacement in half liter Thoerner's gas sampling bottles. At first a saturated solution of common salt (sodium chloride) was used in the sampling bottles to avoid dissolving any of the constituents of the air. Experience later indicated that there was no material advantage in using salt solution in this study, so water was substituted. The samples were taken to the laboratory and analyzed by means of a modification of the iodine pentoxide method devised in our laboratory.*

The method was chosen only after an exhaustive study of other methods, each possessing certain advantages and disadvantages for the purpose intended. By this technic the carbon monoxide is oxidized to dioxide by iodine pentoxide, and iodine is liberated. Accurate measurement of the latter by titration with sodium thiosulphate solution makes possible the calculation of the amount of carbon monoxide.

METHOD

Certain safeguards must be employed to exclude errors. The sample of air first passes through a bath of concentrated sulphuric acid, at room temperature, to remove part of the moisture, then through a bath of the same acid, maintained at a temperature of 150° C., which takes out heavy hydrocarbons, much of unburned gasoline and methane. It then passes through another bath like the first, which serves to condense acid fumes liberated in the hot bath. Unburned gasoline and hydrogen are removed by activated charcoal and the remaining moisture is absorbed by a series of dehydrating agents, consisting of soda lime, solid potassium hydroxide, and an absorbent called "dehydrite" (magnesium perchlorate trihydrate—Smith) in the order named.

After this preliminary treatment, the carbon monoxide in the sample reacts with the iodine pentoxide at a constant temperature of 150° C. in a thermostatically controlled chamber, forming carbon dioxide and iodine. The latter is absorbed in 10 per cent potassium iodide, after which the air passes to a meter and manometer for the purpose of measuring the amount and pressure respectively. The iodine pentoxide is seasoned before use by heating at 215° C. until no more free iodine is liberated, a process ordinarily requiring several weeks. A micro-burette fitted with a platinum hypodermic needle is used for titrating the iodine with one-thousandth normal thiosulphate solution. The needle makes it possible to get very small drops, thus increasing the accuracy of the titration—an essential factor when dealing with low concentrations of carbon monoxide.

After the analysis, the apparatus is washed with seven times the volume of air

* A detailed description of this method will later be published by Mathew J. Martinek and William C. Marti, who devised the modifications.

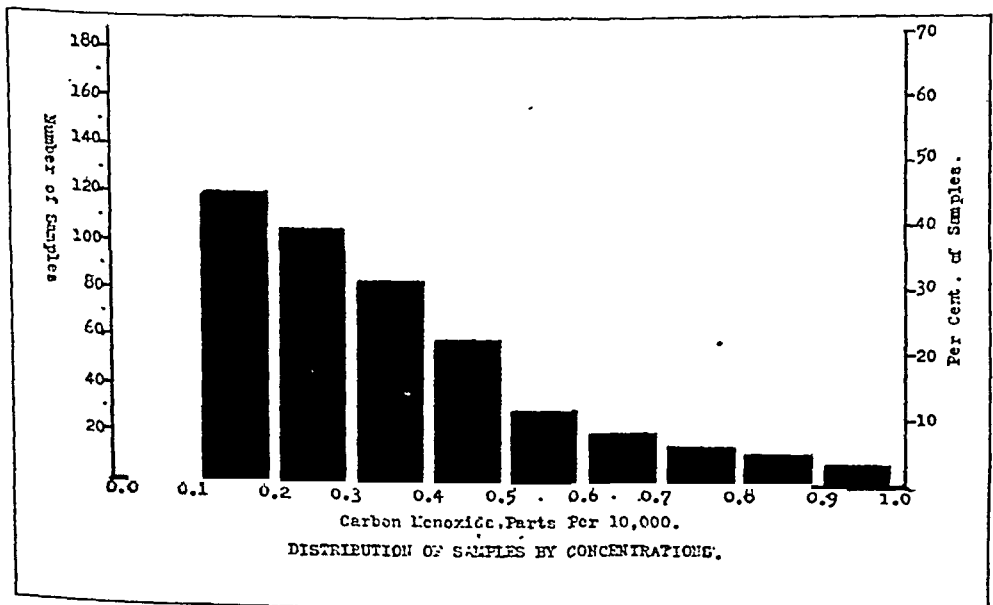
TABLE I
AIR SAMPLES CONTAINING VARIOUS AMOUNTS OF CARBON MONOXIDE

Concentration in Parts per 10,000	Number of Samples	Per Cent of Total	Per Cent Having Higher Concentrations
0.00-0.04	66	10.2	89.8
0.05-0.10	120	18.5	71.3
0.11-0.20	121	18.6	52.7
0.21-0.30	105	16.2	36.5
0.31-0.40	85	13.1	23.4
0.41-0.50	60	9.2	14.2
0.51-0.60	32	4.9	9.3
0.61-0.70	22	3.4	5.9
0.71-0.80	16	2.5	3.4
0.81-0.90	13	2.0	1.4
0.91-1.00	9	1.4	0.0
Total	649	100.0	

sampled, taken from an uncontaminated source, as a control. Pipes to the outside air, approximately 100 feet above street level, are used to secure this air, rather than run the risk of using laboratory or street level air. Test runs made with air containing various known amounts of carbon monoxide have demonstrated that this method is accurate for quantities of carbon monoxide down to as little as 0.1 part of carbon monoxide to 10,000 parts of air. Blank determinations, using the same amount of air as used in flushing the apparatus, are also made to insure accurate results.

As would naturally be expected from the wide distribution of sampling points, the greater number of samples show low concentrations of carbon monoxide. Omitting from our consideration for the moment the samples from the lower level of Wacker Drive, it is found that 85

FIGURE I



per cent of the other 649 samples examined showed 0.5 part or less per 10,000 parts of air, and 63 per cent showed 0.3 part or less per 10,000. Table I and Figure I indicate the proportions of the total number of samples containing various amounts of carbon monoxide.

The average concentration for the city, of all the samples, was 0.31 part of carbon monoxide per 10,000 parts of air. If this amount were uniformly distributed, there would be, of course, little cause for apprehension. Table II and Figure II show that such is not the case, but that the poisonous gas is concentrated along the boulevards.

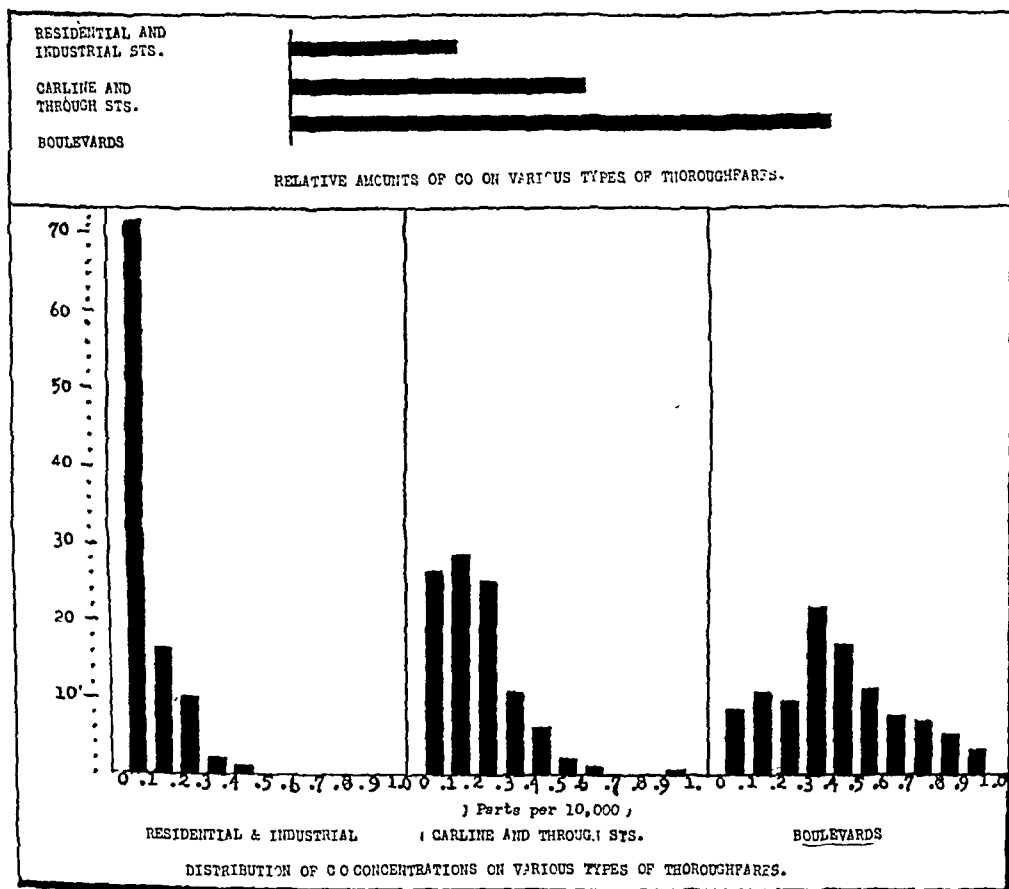
TABLE II
CARBON MONOXIDE IN VARIOUS KINDS OF STREETS

Concentration in Parts per 10,000	Residential and Industrial Streets % of Samples	Traffic Streets % of Samples	Boulevards % of Samples
0.00-0.10	71.0	26.5	8.4
0.10-0.20	16.0	28.0	10.4
0.20-0.30	10.0	25.4	9.6
0.30-0.40	2.0	10.6	21.6
0.40-0.50	1.0	6.1	16.8
0.50-0.60	0.0	1.9	10.8
0.60-0.70	0.0	1.1	7.6
0.70-0.80	0.0	0.0	6.4
0.80-0.90	0.0	0.0	5.2
0.90-1.00	0.0	0.4	3.2
	100.0	100.0	100.0
Average concentrations (Parts per 10,000)	0.125	0.250	0.476

Figure II shows the distribution of samples by concentrations upon three types of streets: (1) residential and industrial streets, (2) traffic and carline streets, and (3) automobile boulevards. The relative amount of the pollution of air with carbon monoxide upon the three classes of streets, as measured by the average concentration of samples in each group, indicates that the boulevards have approximately twice the air pollution of the traffic streets and four times that of the residential and industrial streets.

The concentration by districts was greatest downtown in the "loop" (0.53 part per 10,000), where there is also the greatest density of persons exposed. To the east lies Lake Michigan, upon which no samples were taken. Densely populated areas surrounding the loop on the other three sides showed from 40 to 57 per cent as much carbon monoxide in the air as did the loop district (0.21 to 0.30 part per 10,000), while other portions of the city more remotely situated and less thickly inhabited revealed only 28 to 34 per cent as much as in the business center (0.15 to 0.18 part per 10,000).

FIGURE II



A definite correlation, as was confidently expected, was found to exist between the number of automobiles passing the sampling stations at the time of collecting the samples and the amounts of carbon monoxide found to be present. Table III shows that as the number of cars increased, the carbon monoxide followed the same upward trend.

TABLE III
SHOWING INCREASE IN CARBON MONOXIDE CONTENT WITH GREATER AUTOMOBILE TRAFFIC

No. of Automobiles Passing Sampling Station in 5 Minutes of Test	Carbon Monoxide Parts per 10,000
0	0.10
1-50	0.17
50-100	0.27
100-200	0.35
200-400	0.51
400-1000	0.64

We may consider that the 0.1 part per 10,000 present when no automobiles were passing is a residual amount. The amount of carbon monoxide less this residual amount varies approximately as the logarithm of the number of automobiles passing during 5 minutes.

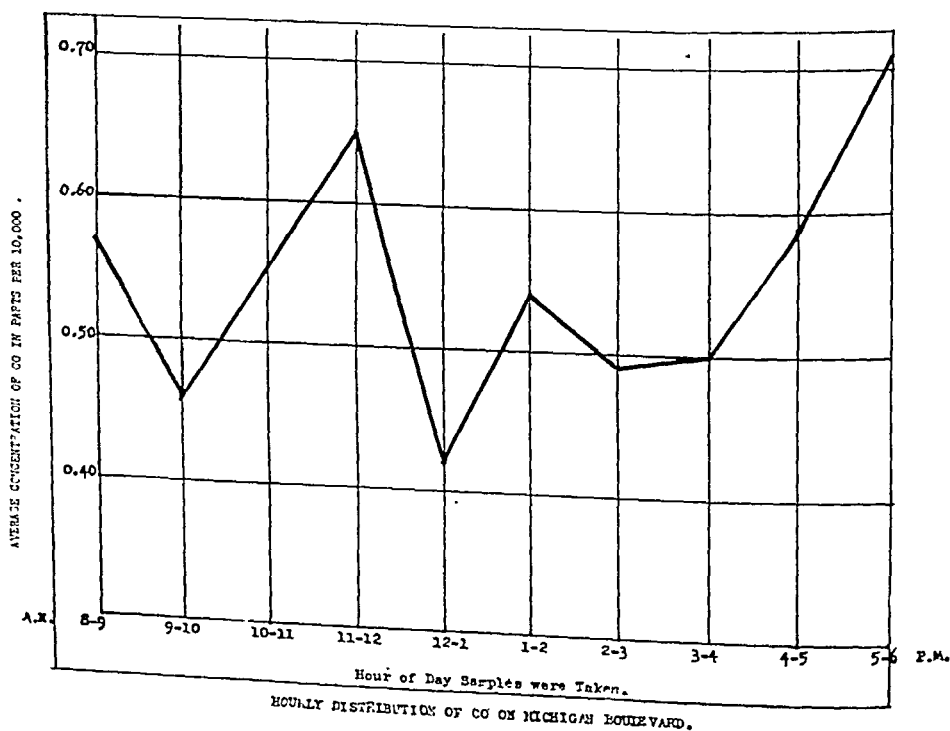
On busy boulevards a pronounced variation was found in the carbon monoxide content of the air at various hours of the day, reaching peaks during the rush hours. Figure III shows the hourly fluctuations upon Michigan Boulevard in the portion closest to the loop, namely between the Chicago River and Harrison Street. Maxima occur during the morning and evening rush hours, 8:00 to 9:00 a.m., and 5:00 to 6:00 p.m., respectively, and also between 11:00 a.m. and 12:00 m., and between 1:00 and 2:00 p.m. The latter two peaks coincide with increases in automobile traffic.

CARBON MONOXIDE AND TWO-LEVEL STREETS

Two-level streets are not yet in very common use, but prophets are not lacking who predict that the future will bring many of them in congested centers. The lower level of Wacker Drive is open to the river on one side and therefore conditions are not so bad as if both sides were enclosed. Nevertheless the primary sense impression of the air on the lower level is frequently far from good, especially when traffic is held up owing to bridges being opened for the passage of vessels.

Forty-one air samples taken there and on the lower level of Michi-

FIGURE III



gan Boulevard adjoining at various times of the day and on six different days have been examined. But one sample showed less than $\frac{1}{3}$ part per 10,000 of carbon monoxide, whereas three showed more than 1 part. The maximum was 1.33 and the average 0.620 part per 10,000. This average is higher than that of boulevards (0.476) or of the loop district (0.530).

Fortunately there are relatively few people who spend many hours a day on the lower level. The Department of Health has refused permission to use that level as a source of air supply for stores, offices or similar spaces in adjoining buildings.

CONCLUSIONS

1. In general, the concentration of carbon monoxide in the air of city streets other than automobile boulevards is insufficient to constitute a serious public health hazard.

2. At times the air of automobile boulevards contains enough carbon monoxide to menace the health of those exposed over a period of several hours, particularly if their activities require deep and rapid breathing.

3. Automobile boulevards at street level and the lower level of double-decked streets do not afford a satisfactory source of air supply for habitable rooms.

4. Studies should be continued to determine the relationship existing between the concentration of carbon monoxide in boulevard air and the extent of blood saturation and injury to health of people continuously exposed to such air for considerable periods of time.

5. Studies of the necessity for mechanical ventilating systems should be a part of the design of all double-decked streets for use by automobiles.

6. Idling of motors on the streets should be restricted to a minimum. If idling cannot be prevented, at least it should not occur near air intakes for ventilating systems.

7. The stack effect of tall buildings in the downtown area in promoting circulation of air is not enough to compensate for the greater production of carbon monoxide in this area and for the interference of buildings with the flushing action of the wind. The result is a higher concentration of gas in the region where most of the people congregate than in the less densely inhabited areas.

8. The possibility of injurious effects, upon the health of susceptible age groups or individuals, from carbon monoxide in concentrations below 1 part per 10,000 should be carefully investigated in order that the public health importance of this gas in street air may be appraised.

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Porto Rico and Its Milk Problems

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THE milk supply is a serious problem in practically all tropical countries. In addition to climatic conditions which greatly increase the difficulties of maintaining a high bacteriological standard, there are other problems not so readily appreciated by the sanitarian of the temperate zone.

Despite the difficulties, the milk industry in Porto Rico has shown marked improvement in the past ten years. Several factors have influenced the change:

1. Sanitary supervision and inspection
2. Enforcement of a chemical and bacteriological standard with routine examination of samples
3. Improvement of cattle breeds and of operative methods

Conditions in Porto Rico some 15 years ago as regards the milk supply are well described by Lucas, Sárraga and Benítez in an article published in 1913. The following is a summary of the situation as it then appeared to them:

The native cow is of no particular breed but is a mixture of different strains introduced into the island from time to time. The object of cattle raising here is not to produce meat or milk but to provide oxen for draft animals. The cow as a milk producer has been ignored. And no attention has been given to the improvement of the stock, with a view to increasing the milk supply. Furthermore, the various small dairies are operated very inefficiently. Milking is done only once a day and it is custom to allow the calf to suckle first in order to start the flow. . . .

To this we may add that most of the dairies had no barns. The cows were kept in the pasture all day and were milked under thatched structures (ranchos) which had neither cement nor other solid flooring. Milking was frequently done by farm laborers who were paid for the extra service with a quart of milk daily. The cattle were fed only on grass. No method of cooling the milk was used and no special quarters were provided for storing either the milk or containers. Milk was carried in tin cans and peddled at every house door. Delivery was made by pouring from the can into any receptacle the purchaser might present. Refrigeration and the individual milk bottle were practically unknown. It is hardly necessary to say that milk produced under such conditions was a menace to health.

Although present conditions are not ideal, even the casual observer can see that a tremendous improvement has been made in the last ten years. Competition and improved economic conditions, together with a strenuous sanitary campaign, have operated to bring about changes in the industry of greatest benefit to the consumer.

At present wherever local organization permits proper enforcement, every dairy is required to have a stable constructed according to specifications of the Department of Health. Among other things, there must be ample ventilation, running water, concrete floors, milk room with cooler and bathroom for milkers. All milkmen must have certificates of good health issued by the Department of Health. Besides a routine physical examination, samples of blood are taken for the Wassermann test, of feces for intestinal parasites, nasopharyngeal exudate for diphtheria, and sputum for tuberculosis. All these examinations must be negative if the medical certificate is to be granted.

Most large dairies have refrigeration plants on the farms, but smaller dairies cannot afford such expense and use water coolers. Milk is brought to San Juan in large cans on motor trucks and cooled at the depots where it is bottled and distributed; or it is bottled at the dairy and sent directly to the consumer.

Pasteurization was not successfully practiced in Porto Rico up to last year (1927) when a plant was established in San Juan.* This is a modern plant with a capacity for 30,000 quarts. The continuous system is used. This pasteurized milk has been generally accepted by the public, and already another company is building a large plant.

Refrigeration is becoming more and more widely practiced, though in small towns development has been slow. The rapid spread of electric refrigeration is facilitating the change.

Competition and the wide educational campaign carried on for some years by the Department of Agriculture and Labor and the Department of Health have brought about a great change in methods, particularly as respects cleanliness, cooling of milk, sterilization of bottles, two daily milking periods, the use of concentrated feed, etc.

The average retail price of milk in San Juan is 20 cents a quart throughout the year. This price appears excessive, but if we study local conditions we shall see the reason for the high figure.

The native Porto Rican cow is a poor producer, averaging only 4 quarts a day. Dairy men began some years ago to import cattle from the United States—Holsteins, Guernseys, Jerseys and Ayrshires—but since the island was, and still is, tick infested, many of the imported cattle died from Texas fever. It was decided to import bulls, and cross the native cows with different breeds in order to improve the stock. Crossing has been going on now for several years and a new type of cow is being raised which is better adapted for dairying.

In Porto Rico the Department of Agriculture has started a campaign for tick eradication but the solution of that problem is un-

* Several plants were established previous to this but were commercial failures.

doubtedly a long way off. Imported cattle are quite expensive, as might be expected. Transportation alone from New York or Texas to Porto Rico amounts to some \$50.00 per head.

The price of grazing land too is very high in Porto Rico. Three-fourths of the most fertile land of the island is held by sugar interests either for growing cane or for pasturing draft animals, chiefly oxen. The continuous development of the sugar industry has driven the dairymen to small farms, where they are compelled to keep their cows in stables, with little land for grass.

Concentrated feed is used in practically all dairies. One pound is generally allowed for each quart of milk produced. All concentrated feed is imported from the United States, the average price for it here being 3 cents a pound. At the present time the best dairies have an average production of 9 or 10 quarts per head, while the poorer dairies get 4 to 6 quarts, averaging 7 to $7\frac{1}{2}$ quarts per cow. The average price paid to the dairyman for his milk is 12 cents a quart.

All these conditions—high cost of dairy cows, high cost and scarcity of land, and high cost of concentrated feed—together with low production, explain the high cost of milk.

The legal standard established by the Commissioner of Health is as follows:

All milk sold in Porto Rico must conform to the following standard:

Not less than 12 per cent dry residue

Not more than 88 per cent water

Not less than 3 per cent butter fat

Not less than 1.030 specific gravity

No foreign substance

Refraction not less than 36.5 at a temperature of 20° C. of the copper serum

Not less than 0.7 per cent mineral matter

No pathogenic bacteria

Not more than 500,000 bacteria per c.c.

As regards pasteurized milk, it is required that all raw milk coming to the plant for pasteurization shall not have more than 1,000,000 bacteria per c.c. and not more than 10,000 bacteria per c.c. after pasteurization. All pasteurized milk shall be sold within 36 hours after pasteurization. It shall be kept at 10° C. until it reaches the consumer, and shall be sold in original containers only.

The high price of milk increases greatly the temptation to adulterate, a temptation that is especially great in a country of low wages and much unemployment. Dilution with water used to be very common, but in recent years it has been markedly reduced by the enforcement of the statutes against the practice.

Another method which has come into vogue recently is the dilution

of raw milk containing high butter fat content with dried skim milk imported from the United States at a very low price. This adulteration is very hard to detect, especially when the content of the skim milk powder is less than 20 per cent.

Preservatives have been used at times in the attempt to make raw milk last longer. Bicarbonate of soda, boric acid or borate of soda seem to be the most used.

Routine bacterial counts on milk are being made and very few dairies fall below the standard. It is usually found that dairies where the cows are kept in the barns all day have higher counts than those in which the cows are brought in only at milking hours. There is an appreciable difference in counts between the cooler and hotter months. Refrigeration is often inadequate in the summer, even though here in the tropics there is a difference of only about 10° F. between the mean temperatures of summer and winter.

It is very hard to determine the per capita consumption of milk, especially in the rural zone where no accurate data are available. The average for the whole island has been estimated by the Department of Agriculture as only 30 gm. San Juan, the largest city in the island, consumes proportionally more milk than any other city in Porto Rico. Its per capita consumption is $\frac{1}{3}$ quart. No data of other cities are available, but it is the general opinion of health officers that it is considerably smaller. In determining the per capita consumption in Porto Rico the large amount of condensed, evaporated, and powdered milk which is imported should be included. Much butter and cheese are also brought in. It is difficult to secure either the amount of these supplementary dairy products, or to get any data as to their local distribution. But they do constitute very important additions to the general food supply.

Porto Rico has a high infant mortality, there being 147 deaths for every 1,000 births (average of the last 5 years). Diarrhea and enteritis head the list of causes of infant deaths. Milk has been blamed as the main cause of such a high infant mortality, but we believe this assertion is altogether unjustified, and that communicable diseases, ignorance, poverty, unsuitable and inadequate food, are responsible in large part for the high infant death rate.

The old statement that it was impossible to have pure, clean milk in the tropics on account of the high temperature has been proved wholly false. There is no reason milk in the tropics cannot be as good as in other climates, provided it is produced and handled by proper methods, and particularly if proper attention is given to refrigeration.

Diabetes in New York City

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IN 29 years the diabetes death rate has doubled in New York City. During this period the death rates from many other diseases declined. The Department of Health records for the entire city, without distinction as to age or sex, show the average diabetes death rate per 100,000 people as follows:

1898.....	10.5
1898-1902.....	11.4
1903-1907.....	14.6
1908-1912.....	15.8
1913-1917.....	20.9
1918-1922.....	19.8
1923-1926.....	22.8

The death rates among males and females, all ages included, were:

TABLE I
DIABETES DEATH RATES PER 100,000

Years	Males	Females
1898.....	9.4	11.6
1898-1902.....	11.1	11.8
1903-1907.....	12.5	16.6
1908-1912.....	13.3	18.2
1913-1917.....	16.7	23.4
1918-1922.....	15.6	23.9
1923-1926.....	16.6	28.9

These general averages for 29 years, according to sex, indicate that the death rate increased in both sexes, but it increased more rapidly in females among whom the rate was consistently higher.

When did diabetes begin to take its toll of human life? Out of a total of 24,850 deaths from this cause in 29 years, only 126 deaths took place among children under 5 years of age.

Among boys and girls from 5 to 15 years of age, 422 deaths took place in this same period. In this age group, too, diabetes was not an important cause of death. Diabetes is clearly not to be classed among the diseases of childhood, as are diphtheria, measles and whooping cough.

In the high school and college group, that is, from 15 to 24 years of age, a total of 680 deaths occurred in this 29-year period. This represents a slight increase, it is true, but even at this age period diabetes was not a very important factor.

In the upper age groups diabetes worked its greatest havoc.

TABLE II
DIABETES DEATHS BY AGES

	25-44 Years	45-64 Years	65 Years and Over
5 years, 1898-1902.....	343	914	605
5 years, 1903-1907.....	432	1,422	933
5 years, 1908-1912.....	481	1,969	1,094
5 years, 1913-1917.....	619	2,786	1,531
5 years, 1918-1922.....	676	2,831	1,754
4 years, 1923-1926.....	403	2,886	1,875
Total.....	2,954	12,808	7,792
Grand Total.....			23,554

Some one may point out that the above three columns do not tell the whole story; that the important factor of growth of population was not included. "If New York City maintained only a stationary population, the above figures would be alarming. But remember how the city has grown. It may have grown so fast during these 29 years that 914 deaths those first 5 years may mean a rate actually higher than 2,886 deaths the last 4 years." Further classification of the death rates per 100,000 population, as shown in Table III, indicates such changes as took place.

TABLE III
DIABETES DEATH RATE PER 100,000 POPULATION IN THE 25-44 YEAR AGE GROUP

Years	Death Rate	Years	Death Rate
1898-1902.....	5.0	1913-1917.....	6.9
1903-1907.....	5.8	1918-1922.....	6.9
1908-1912.....	6.1	1923-1926.....	4.9

DIABETES DEATH RATES PER 100,000 POPULATION AMONG MALES AND FEMALES IN THE 45-64 YEAR AGE GROUP

Years	Males	Females	Average
1898-1902.....	37.1	43.8	40.4
1903-1907.....	45.8	59.6	47.7
1908-1912.....	50.6	70.5	60.6
1913-1917.....	55.9	85.4	70.6
1918-1922.....	46.1	79.2	64.7
1923-1926.....	53.1	101.7	77.4

DIABETES DEATH RATES PER 100,000 POPULATION AMONG MALES AND FEMALES AGED 65 YEARS AND OVER

Years	Males	Females	Average
1898-1902.....	116.5	130.9	123.7
1903-1907.....	138.6	186.1	162.3
1908-1912.....	153.0	184.9	168.9
1913-1917.....	172.4	225.5	198.9
1918-1922.....	157.3	230.2	193.7
1923-1926.....	197.3	303.8	250.5

CONCLUSION

This study of the diabetes incidence in New York City for a period of 29 years—1898 to 1926—supports the view that diabetes is a dis-

ease of adult life. It causes death most frequently just at that period when people are most productive in an economic sense. In the 29 years under review, only 1,296 deaths occurred among those under 25 years of age. Out of a total of 24,850 deaths, 23,554 took place among those who had passed their 25th birthdays. Of the 23,554 deaths, more than half occurred in the 45-64 year age group.

NOTE: Acknowledgment is due Louis I. Harris, M.D., formerly Commissioner of Health of New York City, for providing the statistical material and other assistance for this study.

The Texas Job

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TEXAS is the largest state in the union not now in the U. S. Registration Area for either births or deaths. Not only is it the largest in area but its population is about $5\frac{1}{2}$ millions.

In addition to the official agencies, the American Public Health Association has been extending every effort to aid the U. S. Bureau of the Census in the completion of the registration area and has a special committee for that purpose, and because of the fact that Texas is such an important state the interest of the Association and its committee has been very keen. Arrangements were made to send the writer to Texas at the expense of the Association Committee to Aid Completion of the Registration Area by 1930, so he might aid the state in preparing for the registration area.

The Texas Legislature of 1927 passed a new vital statistics law which is similar to the Model Law, and this law became effective September 1, 1927. About that time W. H. Lackey, Special Agent of the Bureau of the Census, was sent to Texas to aid in the organization but he naturally could only be of advisory assistance. Later the U. S. Children's Bureau had 3 representatives in the field. April 1, W. A. Davis, M.D., was appointed Director of the Bureau of Vital Statistics.

There are 254 counties in Texas and the law provided for a local registrar in each justice precinct and each incorporated place. There are from 4 to 8 justice precincts in each county, although 2 or more precincts could be combined for efficiency of registration. It was found that only 67 of these counties had been organized by the appointment of local registrars and no campaign for registration could be begun until there was a place for the registration of births and deaths. The necessity for completing the organization of the state was apparent.

The appropriation for all health work in Texas was pitifully inadequate and it was necessary to ask for further aid on the outside. After a good deal of correspondence, Louis I. Dublin, Ph.D., the chairman of the committee, succeeded in securing the services of 4 additional men from the Bureau of the Census, the expenses, however, being borne by the committee. The National Tuberculosis Association through its statistician, Jessamine Whitney, furnished additional help in the person of Alice M. Hill. The territory was divided in the best possible manner to facilitate travel—and the campaign was on.

The justice precincts in many cases are indefinitely outlined. In many cases not a single county official could tell definitely where the lines belonged. To go into these districts and locate a proper individual to serve as registrar was a tremendous task. Many registrars were appointed who are undoubtedly not suited to the work, and changes will be necessary, but by June 1 the organization of the state was completed, with a registrar appointed for every precinct or combined district and a definite place for the filing of all birth and death certificates.

There were at the time 11 persons from outside the state at work, all on organization work, with the exception of I. R. Whipper, M.D., a negro woman physician who was put on promotion work among negro midwives. Those engaged in the work were as follows:

American Public Health Association: W. J. V. Deacon, M.D., and Carolyn J. Loewenstein, stenographer

U. S. Children's Bureau: Marie T. Phelan, Alice E. Griffith, and I. R. Whipper

National Tuberculosis Association: Alice M. Hill

U. S. Bureau of the Census: W. H. Lackey, C. C. Jermain, J. J. Hughes, J. C. Stafford, and E. C. Walker

Upon the completion of the organization, the extra Census men were released and the energies of all of those remaining in the field were turned to the promotion work. It was felt that but little could be accomplished in the attempt to do intensive rural work and that our only hope of success lay in bringing the counties in which there were big cities up to the point where registration was reasonably complete. There were about 40,000 unreported births in Texas in 1927. In one county alone in which one of the large cities is located were practically 4,000 of these. If it were possible to bring this county up to complete registration we would account for approximately 10 per cent of our total deficiency.

Every effort was made to use all of the existing agencies in the state such as the chambers of commerce, the American Legion, the parent-teacher associations, the state and county medical societies and their auxiliaries, all of the luncheon clubs, etc.

The writer closed this tour of duty on August 1 and at that time all of the outside workers were withdrawn with the exception of 3 representatives of the U. S. Bureau of the Census who were to aid in vital statistics until about August 15 when they would be assigned to other Census duties but would be permitted to do such work in vital statistics as they could in connection with their other work.

J. C. Anderson, M.D., State Health Officer, and W. A. Davis, M.D., director of the bureau, have been keenly interested and have helped as far as possible within their means. Dr. Davis has of course a tremendous job to organize his office to a state of efficiency, particularly as he has no trained help due to political turn-over in the past, but his organization is gradually being assembled and when trained should furnish the state an efficient registration unit.

The job was a difficult one but we are in hopes that some good will develop from our efforts.

EDITORIAL SECTION

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OUR 57TH ANNUAL MEETING

THE 57th Annual Meeting will go down in history as one of the best and largest. It was held in conjunction with the American Child Health Association, at the same time as meetings of a number of related societies, such as the American Association of School Physicians, American Social Hygiene Association, International Association of Dairy and Milk Inspectors, Association of Women in Public Health, Conference of State Sanitary Engineers, State Laboratory Directors Association, Women's Foundation for Health and the Conference of Illinois Health Officers and Public Health Nurses. All of the sessions were held in the Stevens Hotel, which was the headquarters of the Association.

The result was an unusually large concourse of public health workers along various lines.

The General Sessions, held in the evenings, were all broadcast, and every afternoon eminent workers in the field of public health contributed to the radio program. There were on the scientific programs 280 speakers and 80 scheduled functions, in addition to informal group meetings. The Health Exhibit was unusually complete and large, with 102 exhibitors. The hall was open to the public during the late afternoons and evenings. This exhibit was so successful that it is our intention to continue it as a permanent feature.

The Scientific Exhibit was also unusually extensive and well organized, and, judging from the large attendance, it served the purpose intended by its directors. Here health officers could see what other communities are and have been doing, since a number of cities and states had exhibits which were prepared with the utmost care, giving graphic presentation of the problems which confront every health officer.

In addition to the exhibits at the place of meeting, there were

traveling exhibits in the Illinois Central Railroad yards where the latest models of glass-lined tanks for the shipment of bulk milk were shown; the Missouri Pacific Better Health Car and the Mine Rescue Car sent out by the U. S. Bureau of Mines were exhibited and explained to visitors by trained workers. Motorized laboratories for the examination of water and other interesting aids employed by state health departments were parked within a short distance of headquarters.

Last year for the first time the problem of undulant fever was brought to our attention. This year it was one of the most important features of the entire program, having been considered in the Laboratory Section in a symposium. There seems to be no question that undulant fever is much more widely distributed than has been suspected. While its incidence will vary according to the part of the country considered, everywhere it is one of the newer problems with which the health officer must cope. One rather startling feature brought out in the discussion of undulant fever was an unsuspected prevalence of typhus fever in the southern part of the country.

Needless to say, the discussion on foods and nutrition received due attention. Two subjects which are comparatively new to our meetings were featured: one, the influence of the lack of sunshine, due to pollution of the air; and the other, oral hygiene, which was considered at a special joint session.

It is impossible and would be invidious to pick out certain papers for special attention. On the whole the papers presented were high class and most of them considered practical problems. Despite what we have just said, we wish to call attention to the address of Dr. Frank G. Boudreau, of the Health Section of the League of Nations, explaining the functions and working of the Health Section of the League of Nations, in which he stated his conviction that the public, including even physicians and health workers, is too little aware of what is being done by this body and of its importance to world health.

We were especially glad to note an unusually large number of delegates from the southern republics, Mexico and Cuba, which are constituent members of the Association. Canada was well represented, and we were glad to see two of the pillars of the Association, who are known to young and old members alike, Drs. Charles H. Hastings of Toronto, and Peter H. Bryce of Ottawa.

To the Local Committee, headed by Louis E. Schmidt, M.D., the Association owes a debt of gratitude, not only for the excellent arrangements made for the meeting, but also for its untiring and constant watchfulness during the session.

While the unexpectedly large attendance proved too much for the capacity of the rooms of certain sections during some of the discussions, we must feel great satisfaction over the intense interest shown by such a large number of people. The total registration was about 2,800. The new president of the Association is George W. Fuller, of New York City. Our 58th Annual Meeting in 1929 will be held in Minneapolis, Minn.

The Chicago meeting will stand out always as an unusual success and all who were fortunate enough to attend will bear in grateful remembrance the many courtesies of which they were the recipients.

OPPORTUNITIES MISSED BY PHYSICIANS

ALTHOUGH we can find statements proving that physicians for many centuries have had some ideas of the prevention of disease, we still believe it to be the fact that they have been more concerned in the healing of the sick than in the causes and conditions leading to disease. We know that Sir Edwin Chadwick began the hygienic reform in England, while Lemuel Shattuck took the lead in the United States. Pasteur, who was not a physician, revolutionized medicine, so that our debt to non-medical men is great, and can be satisfied only by accepting their findings and promulgating their ideas.

The recent studies of nutrition have brought to the front the name of another man, Captain James Cook, who, without any training in medicine, worked out for himself the prevention and even cure of a disease which was formerly the scourge of sailors; namely, scurvy. He was the son of a farm laborer, born in 1728, in Yorkshire, England. He began his career on the sea as a boy on coal vessels, in which he spent 12 years of his life. He finally joined the Royal Navy as an able seaman, and soon after made the acquaintance of scurvy. The first ship on which he served, after a cruise lasting only between three and four months, returned to port with 130 men sick, of a crew of 400. Two years later he was promoted to master, and served on the North American Station where scurvy was only too frequently seen. Later he was put in command of the "Endeavour" which was sent to the South Sea Islands in 1769. At the end of five months, his surgeon reported that there was no scurvy on the ship. He spent six months surveying and charting the coasts of the islands in the neighborhood of New Zealand, and later the east coast of Australia. After having been partially wrecked on a reef, he made temporary repairs, and

finally reached Batavia, from which point he sent a report to the Admiralty saying that during the entire voyage he had not lost a single man from scurvy. Unfortunately there was a great deal of sickness at Batavia, and before he reached the Cape of Good Hope 34 deaths had occurred from fever and dysentery.

Two of his observations stand out with especial clearness. He carried, as antiscorbutics, malt, sauerkraut, orange and lemon juices, soup, and always obtained vegetables when possible. At Tierra del Fuego, he collected wild celery, and one meal a day consisted of this with ground wheat and soup. He also used all the wild herbs he could obtain. It is interesting to note that he had difficulty in making his seamen eat some of the new messes which he prepared, but he had them on his own table for himself and officers, and when the men saw this, they ate them. Captain Cook says of them that they were of "infinite service" in preventing the "scorbutic taint."

The second observation made by Cook was that even the best articles of food sometimes failed unless supplemented by other hygienic measures. He changed the old watch hours, four on and four off, so that the men had eight hours off duty twice in 24 hours. In addition, he fumigated the ship, keeping her as clean and dry between decks as possible, and insisted that too much attention could not be paid to ventilation and keeping the air pure.

On his second voyage, which lasted three years and eighteen days, Cook was in charge of two ships selected by himself. During that time, he did not lose a single man from scurvy on his own ship, "Resolution," though several on the "Adventure" died from the disease, unquestionably because he was not on board and his orders were not strictly carried out. For his discovery and the good results obtained from it, he was unanimously elected a Fellow of the Royal Society, and was soon after awarded the Copley medal.

On his third voyage he was killed in a fight at Hawaii, but his officers had learned their lesson, and though both ships were cruising four years and two months, not a single case of scurvy occurred on either one.

Cook's observations seem to have been made without the assistance of physicians and without any particular medical knowledge. His name will always be honored as the man who banished from the seas a dreaded and crippling disease which had for many years taken its toll of the "toilers of the sea."

SEWAGE WORKS JOURNAL

ON October 1, the *Sewage Works Journal* made its first appearance. This fine magazine is the official publication of the Federation of Sewage Works Associations, the purposes of which are described in its constitution as being:

The advancement of fundamental and practical knowledge concerning the nature, collection, treatment and disposal of sewage and industrial wastes, and the design, construction, operation and management of sewage works, through the correlation and strengthening of local, state and district sewage works associations, and the publication of a journal designed to meet the needs of persons active or interested in these fields of endeavor.

The promotion and encouragement of improved waterways sanitation, through the same measures.

The material in the first issue of the new journal will be of great interest to engineers in the public health field and of more limited interest to all sanitarians.

Many of the members of the Federation's working committees are members of the American Public Health Association and the Association is therefore much gratified in observing the success with which the efforts of the first group of persons interested in this movement have been rewarded. One of the meetings of the group which fostered the organization of the Federation was held conjointly with the meeting of the Association last year.

We wish the Federation success in this effort, as well as in all its work.

ASSOCIATION NEWS

The new officers of the Association for 1928-29 are as follows:

President, George W. Fuller

First vice-president, A. J. Chesley, M.D.

Second vice-president, Norman MacL. Harris, M.B.

Third vice-president, Louis E. Schmidt, M.D.

Treasurer, Edwin O. Jordan, Ph.D.

The newly elected members to the Executive Board are:

Hugh S. Cumming, M.D.

Haven Emerson, M.D.

William C. Hassler, M.D.

The newly elected Governing Councilors for the term expiring in 1931 are:

Hugh S. Cumming, M.D.

Lee K. Frankel, Ph.D.

E. V. McCollum, Ph.D.

A. T. McCormack, M.D.

J. W. S. McCullough, M.D.

Stanley H. Osborn, M.D.

W. S. Rankin, M.D.

M. P. Ravenel, M.D.

W. F. Snow, M.D.

H. A. Whittaker, C.E.

The Fifty-eighth Annual Meeting will be held in Minneapolis, Minn.

GEORGE W. FULLER, PRESIDENT

A. P. H. A.

MR. FULLER was born December 21, 1868, at Franklin, Mass., and was graduated from the Massachusetts Institute of Technology in 1890. He took the courses in bacteriology at the Hygienic Institute at the University of Berlin and later studied in the private office of Piefke, Engineer of the Berlin Water Works.

About nine years were then devoted to research work on methods of purifying water and sewage from the biological, chemical and engineering viewpoints. He was with the Massachusetts State Board of Health for nearly five years, first as a bacteriological assistant to Prof. Sedgwick during investigations of typhoid epidemics in the Merrimac Valley, and later was in charge of the Lawrence Experiment Station. In 1895 he went to Louisville and there and at Cincinnati had charge for nearly four years of extensive investigations of the means of purifying Ohio River water.

Mr. Fuller has been in private practice since 1899 with offices in New York, specializing in matters of water supply, water purification, sewerage and sewage disposal. He was in partnership with

the late Dr. Rudolph Hering from 1901 to 1911. He has also devoted much study to economic problems, especially as related to the valuation of water works and street railway properties in the Pittsburgh, Philadelphia and Buffalo districts. For several years he was expert adviser to Mitten Management, Inc.



GEORGE W. FULLER

Mr. Fuller has taken a keen interest in activities aimed toward standardization of practices related to the public health field. He was secretary of the convention of bacteriologists, held in New York in June, 1895, to consider improved methods and was a member of the committee reporting on this subject in 1896-97. In 1899 at the Minneapolis meeting of the American Public Health Association he was appointed chairman of the first Committee on Standard Methods of Water Analysis. It presented its report at the meeting of the Association at Havana in January, 1905.

He was chairman of the Standardization Council of the American Water Works Association from 1920 to 1927 and was active in preparation of the *Manual of Water Works Practice* appearing in 1925.

Mr. Fuller has served the American Public Health Association in many capacities—as chairman of the Committee on Organization in 1925; member of the Governing Council from 1923; member of the Executive Board 1924-1928, serving two terms; member of the Finance Committee 1927-1928; and first vice-president of the Association 1927-1928.

He has served more than 150 of the larger cities and towns in various parts of the United States and Canada in matters of water supply, sewage disposal and control of stream pollution.

For over 20 years he has been active on developments related to the problems of the Sanitary District of Chicago and was on a commission in 1921-22 which selected the method and locations of the project now known as the North Side Sewage Treatment Works.

Mr. Fuller was a member of the Franco-American Engineering Congress convened at Paris directly after the Armistice to consider various reconstruction and economic problems in France.

He is a Past President of the American Water Works Association, Vice-President of the American Society of Civil Engineers, member of the American Chemical Society and American Society of Bacteriologists; Institution of Civil Engineers of Great Britain, and the Engineering Institute of Canada. He is a member of the Committee on War Memorial to American Engineers at Louvain, Belgium, representing the American Society of Civil Engineers. He is a member of the Executive Committee and Chairman of the Committee on Promotion and Attendance of the World Engineering Congress to be held at Tokyo, Japan, November, 1929.

Mr. Fuller has written three books, including: *Water Purification at Louisville*, 1898; *Sewage Disposal*, 1912; and in association with J. R. McClintock, his partner, *Solving Sewage Problems*, 1926.

RESOLUTIONS

Presented by the Committee on Resolutions, W. S. Rankin, M.D., Chairman, and adopted by the American Public Health Association at the Fifty-seventh Annual Meeting, Chicago, Ill., October 15-19, 1928.

ASSISTANCE TO FLOOD AREA

1. WHEREAS, during the unprecedented floods in the Mississippi Valley in 1927, for the first time in American history, an effective public health program was initiated in more than 90 counties in the 7

states involved in that disaster, which involved the setting up in them of full-time health departments, with adequately trained personnel; which resulted in the saving of many lives and much unnecessary illness; and

WHEREAS, this program was inaugurated by the Surgeon General of the U. S. Public Health Service, the Medical Director of the Rockefeller Foundation, and the Governors and Health Officers of the states involved, and made possible by the generous approval of the President and the Congress; and

WHEREAS, it was contemplated that this coöperation program might be terminated in 18 months; but that this hope was dissipated by a repetition in 1928 of floods in the same area quite as economically disastrous as those of the preceding year; now, therefore, be it

RESOLVED by the American Public Health Association in its annual convention assembled, that it approves the wise plan of public health administration successfully operated in the Mississippi Valley for the past 18 months, and, being advised as to the economic condition in these counties, and further realizing that adopted federal plans will soon start public work in these counties involving much larger groups of labor than were found necessary to build the Panama Canal, with resulting public health problems quite as great as that monumental enterprise, that it memorializes the President and the Congress to continue the assistance that is being extended to these counties for 2 more years, after which it should be gradually reduced over a term of several years until each of the counties affected is restored to economic independence.

PARKER BILL

2. WHEREAS, the Parker Bill for the correlation of federal health activities was passed by the Congress of the United States at the first

session of the Seventieth Congress, but was vetoed by the President on May 18, 1928; and

WHEREAS, the principles of this excellent and necessary measure have been endorsed each year for the past 3 years by the American Public Health Association in convention assembled; therefore, be it

RESOLVED, that the American Public Health Association most strongly urges that Congress pass the Parker Bill for federal health co-ordination over the veto of the President, in order that the country may have the benefit of this advantageous legislation.

TUBERCULOSIS

3. RESOLVED:

1. That, in the light of our present knowledge of tuberculosis, every case should be placed under appropriate sanitary control;

2. That the essential part of any effort in bringing tuberculosis cases under control depends primarily upon the existence of an accurate and complete registration of cases;

3. That state and local health officers should take the initiative in promoting the reporting of cases by physicians and institutions;

4. That local health officers be requested to secure more complete and accurate reporting in their respective districts;

5. That the success of reporting tuberculosis depends upon the sympathetic support of the medical profession;

6. That the subject of the reporting of tuberculosis cases be presented to state and local medical societies, asking for their co-operation and support.

IN MEMORIAM

4. RESOLVED, that it is with a sense of irreparable loss that the American

Public Health Association takes note of the deaths since our last meeting of the following members and Fellows:

T. Howard Barnes,
New York, N. Y.

Clarence W. Bassett, M.D.,
Sharon, Conn.

Arthur W. Bingham, M.D.,
New York, N. Y.

Arthur G. Bretz, M.D.,
New York, N. Y.

Chauncey F. Chapman, M.D.,
Lincoln, Neb.

Daniel Connolly, M.D.,
Kingston, N. Y.

Prof. Charles I. Corp,
Madison, Wis.

H. A. Duemling, M.D.,
Ft. Wayne, Ind.

C. E. Durham, M.D.,
Austin, Tex.

Joseph C. Elfers, M.D.,
Sheboygan, Wis.

L. M. Field, M.D.,
Beloit, Wis.

Matthew J. Fitzpatrick, M.D.,
Mason City, Ia.

Perry D. Gaunt, M.D.,
Warsaw, Ill.

Winifred S. Gibbs,
New York, N. Y.

Col. V. Havard,
Fairfield, Conn.

Edward A. Holmes, M.D.,
Downsville, N. Y.

Walter B. James, M.D.,
New York, N. Y.

Prof. James O. Jordan,
Boston, Mass.

Francis M. Kennedy, D.D.S.,
New Bedford, Mass.

F. H. Lee, M.D.,
Canaan, Conn.

Harriet L. Leete, R.N.,
Far Rockaway, N. Y.

Adam S. MacKnight, M.D.,
Attleboro, Mass.

R. C. Mahaney, M.D.,
Owosso, Mich.

Charles E. Marshall,
Amherst, Mass.

John D. McCarthy, M.D.,
New York, N. Y.

William Morris,
Roselle, N. J.

Francis M. Munson, M.D.,
LaPlata, Md.

W. E. Musgrave, M.D.,
San Francisco, Calif.

Joseph Y. Porter, M.D.,
Key West, Fla.

Mrs. S. R. Prentiss,
Bangor, Me.

S. H. Rantz, M.D.,
Placerville, Calif.

Tom Rosenfield,
Rock Island, Ill.

Frank C. Smith,
Auburn, N. Y.

John A. Smith, M.D.,
Jackson Heights, N. Y.

Francis R. Smyth, M.D.,
Bismarck, N. D.

J. Ross Snyder, M.D.,
Birmingham, Ala.

Margaret Tupper, R.N.,
Paris, France

Solomon Weingrad, M.D.,
Mountaindale, N. Y.

S. W. Welch, M.D.,
Montgomery, Ala.

R. A. Wilson, M.D.,
El Paso, Tex.

YELLOW FEVER HEROES

5. WHEREAS, an unsuccessful effort at the last session of Congress was made to obtain federal legislation

in the interest of the yellow fever heroes in 1900 and their survivors, and

WHEREAS, this Association is informed that a new bill, revised to meet some of the objections to the bill which was defeated in the last session of Congress, will be introduced in the next Session of Congress; now, therefore, be it

RESOLVED, that it is the sense of the American Public Health Association that the people of the United States are under a great and lasting obligation to the soldiers and officers of our country who, in an heroic way, laid the sure foundation for the ultimate and complete control of that great tropical and semitropical scourge, yellow fever; and be it further

RESOLVED, that the Association gives its unqualified endorsement to the proposed legislation and expresses its earnest desire that the next session of Congress give favorable consideration to the new bill and so signalize the lasting gratitude of our people for those who suffered and died for the honor and advancement of our country.

POSTAL LAWS

6. WHEREAS, the promotion of public health depends largely on the systematic instruction of the public in health matters, and

WHEREAS, experience has shown that such instruction is greatly facilitated by the regular publication of bulletins of information by health authorities, and

WHEREAS, in the distribution of such bulletins by mail, the U. S. Postal Laws and Regulations now grant the "second class mailing privilege" to state boards of health but not to county or municipal boards of health, and

WHEREAS, this discrimination un-

justly imposes a heavy financial burden on county or municipal boards of health, and greatly restricts their educational activities, be it

RESOLVED, that the American Public Health Association protests against this unjust discrimination and respectfully requests that Congress amend Section 395 of the Postal Laws, Act of August 24, 1912, by adding the words "county and municipal" so that the second class mailing privilege shall hereafter be extended to "the bulletins issued by state, county, and municipal boards of health"; and be it further

RESOLVED, that a copy of this resolution be forwarded to the Postmaster General and to members of the committees on postal affairs in both houses of Congress, and that the members of this Association be requested to call this resolution to the attention of their representatives in Congress and urge adoption of the amendment therein requested.

CRESSY L. WILBUR

7. WHEREAS, by the recent death of Dr. Cressy L. Wilbur, for years one of the foremost active members of the American Public Health Association, and one of the organizers of the Section on Vital Statistics, an outstanding figure in public health work has left the state of human endeavor, be it

RESOLVED, that the American Public Health Association record its very great indebtedness to its beloved colleague and enter on the minutes of this meeting the following brief biographical note:

Cressy Livingston Wilbur was born at Hillsdale, Mich., March 16, 1865. Graduating from Hillsdale College in 1886, he was the recipient of a Masters

Degree in Philosophy four years later. In March, 1890, Bellevue Hospital Medical College conferred upon him the degree of Doctor of Medicine.

Dr. Wilbur entered into public health work as Chief of the Division of Vital Statistics of the State of Michigan in 1893, serving as such for thirteen years, during which period he found time to lecture on vital statistics in the Medical Department of the University of Michigan, and to act as Expert Special Agent of the U. S. Bureau of the Census, in charge of expansion of the U. S. Registration Area.

Appointed as Chief of the U. S. Bureau of Vital Statistics, July 1, 1906, his field of work assumed a national and international scope. He was the official delegate of the United States to the International Congress for the Revision of the Classification on Mortality and Morbidity, held at Paris, July, 1909. To Dr. Wilbur the credit is due for the preparation of the Model Registration Law, and it was because of his constant efforts that twenty states enacted laws providing for the adoption of this law. He was tireless in working for the extension of the registration area. In 1906, the percentage of the population in the registration area was 49 and in 1914, when his services as Chief Statistician of the U. S. Bureau of the Census ended, the percentage was 66. Cali-

fornia, Colorado, Maryland, Pennsylvania and South Dakota were added in 1906; Washington and Wisconsin in 1908; Ohio in 1909; Minnesota, Montana, North Carolina and Utah in 1910; Kentucky and Missouri in 1911; Virginia in 1913; Kansas in 1914.

He was the chief mover in the re-creation of the section on Vital Statistics of the American Public Health Association, carrying his efforts to a successful conclusion at the meeting of this Association in 1907. For years thereafter his great interest lay in building up the section, and he never ceased to urge its members to spread the gospel of complete registration of sickness and death, and the adoption of standard tables of mortality and morbidity.

In 1914, the late Hermann M. Biggs, M.D., invited Dr. Wilbur to accept the post of Director of the Bureau of Vital Statistics of the New York State Department of Health, a position in which Dr. Wilbur served for several years with distinction, his efforts being concentrated on obtaining a complete registration of births and deaths in the Empire State.

Those who had the good fortune to be associated with him knew Dr. Wilbur as a modest, kindhearted, lovable colleague, and as one who adhered steadfastly to the principles of honest, fair dealing with all.

DR. DE KLEINE GOES TO RED CROSS

William De Kleine, M.D., director of the Child Health Demonstration conducted by the Commonwealth Fund at Salem, Ore., has resigned to become medical assistant to James L. Fieser, vice-chairman in charge of domestic op-

erations of the American Red Cross. Dr. De Kleine assumed his duties at national headquarters in Washington, D. C., November 1. He will succeed Dr. William R. Redden, who recently resigned. Dr. De Kleine is a Fellow of the A. P. H. A.

NEW MEMBERS

- Roy Bennett Adams, Lincoln, Neb., School Physician
- Alma Arneson, Chicago, Ill., Tuberculosis Worker, Sedgwick Street Dispensary
- Henry L. Banzhaf, B.Sc., D.D.S., Milwaukee, Wis., Dean, Dental School, Marquette University
- Mary L. Beal, Fargo, N. D., Supervisor of Health Education
- Mrs. D. Pirie Beyea, Des Moines, Ia., Lecturer for State Board of Health
- Maurice A. Bigelow, Ph.D., New York, N. Y., Director, School of Practical Arts, Teachers College, Columbia University
- George E. Carrothers, Ann Arbor, Mich., Teacher of School Administration, School of Education, University of Michigan
- George Collins, Raleigh, N. C., Director, Bureau of Maternity and Infancy, State Board of Health
- Edward M. Dodd, M.D., New York, N. Y., Medical Secretary, Presbyterian Board of Foreign Missions
- Mark H. Fox, Jacksonville, Fla., President, Seminole Milk Company and Dublin Creamery Company
- Harry H. Freilich, M.D., Chicago, Ill., Tuberculosis Worker, Robey Street Dispensary
- J. F. Fulton, M.D., Staunton, Va., Health Officer
- William Henry Gaub, Cambridge, Mass., Student, University of Michigan (Assoc.)
- Albert S. Gray, M.D., Hartford, Conn., Chief, Division of Occupational Diseases, State Department of Health
- P. W. Gumaer, A.B., B.S., New York, N. Y., Consulting Engineer, The Barrett Company
- Freda M. Gustafson, Chicago, Ill., Tuberculosis Worker, Robey Street Dispensary
- Kirby A. Henkes, Springfield, Ill., Junior Bacteriologist, Diagnostic Laboratory, State Department of Public Health
- Clifford R. Hervey, M.D., Oswego, N. Y., District State Health Officer
- Marion O. Lerrigo, Ph.D., New York, N. Y., Research Worker in Health Education, Emma Dolfinger Memorial Fund
- John N. Libert, M.D., St. Cloud, Minn., Health Officer
- Lenna L. Meanes, M.D., New York, N. Y., Medical Director, Women's Foundation for Health
- Mrs. George D. Morgan, Galveston, Tex., Chairman, Red Cross Public Health Nursing Service (Assoc.)
- Edward M. Morgenstern, M.D., Chicago, Ill. (Assoc.)
- Alexandre Moscoso, M.D., Rio de Janeiro, Brazil, Public Health Officer, National Department of Health (Assoc.)
- L. R. Murphree, M.D., Athens, Ala., Health Officer, Limestone County
- Helen M. Needles, R.N., Des Moines, Ia., Lecturer for State Department of Health
- Annie M. O'Donnell, Sc.D., Greensboro, N. C., Head, Division of Hygiene, North Carolina College for Women
- Russell H. Paden, M.D., Charleston, W. Va., Director, Division of Child Hygiene, State Department of Health
- Walter A. Peirce, Racine, Wis., Manager, Water Department
- Mrs. A. R. Peterson, New York, N. Y., Promoter of Public Health Activities (Assoc.)
- Frederick Peterson, M.D., New York, N. Y., Promoter Public Health Activities (Assoc.)
- C. W. Pfeiffer, M.A., St. Paul, Minn., Executive Secretary, Community Chest (Assoc.)
- Aurelia B. Potts, R.N., Ann Arbor, Mich., Student (Assoc.)
- Bernard E. Proctor, Ph.D., Cambridge, Mass., Instructor, Department of Biology and Public Health, Massachusetts Institute of Technology
- Mrs. Daisy G. Rice, Alton, Ill., Inspector of Hygiene, Public Schools
- Harry W. Rosenthal, Dr.P.H., M.D., Baltimore, Md., Mental Hygienist, University of Maryland
- Mrs. Lois L. Sanford, Morris, Ill., County Chairman, Child Welfare, Grundy County Federation of Women's Clubs
- Richard J. Schmoyer, A.M., Lynn, Mass., Director of Health and Physical Education, Public Schools (Assoc.)
- Philip Shih-Chi Kao, B.S., Chicago, Ill., Medical Student, University of Chicago (Assoc.)
- Harriett Stahley, Chicago, Ill., Tuberculosis Worker, Sedgwick Street Dispensary
- Kenneth H. Sutherland, M.D., Santa Ana, Calif., County Health Officer
- Henry P. Talbot, M.D., Hartford, Conn., Chief of Venereal Diseases, State Department of Health
- Edith M. Walker, R.N., Rochester, N. Y., Associate Director of Health Education, Public Schools
- Charles C. Wilson, Evansville, Ind., Director of Health, Public Schools

DECEASED MEMBERS

- R. C. Mahaney, M.D., Health Officer, Owosso, Mich. Elected member 1927.
- Charles Alfred Lee Reed, M.D., formerly President of the A. M. A. Elected member 1924.

A TRIBUTE TO SAMUEL WALLACE WELCH

SINCE the death on August 22, 1928, of Samuel Wallace Welch Alabama's beloved health officer, expressions of sorrow and loss have come from throughout Alabama and the United States.

Before the impress of this great personality shall have become dimmed by time, a record and an appraisal of his life should be made by those who are best qualified to interpret it for the benefit of future generations.

What manner of man was he and what did he do?

The record of his official acts may be sparsely gleaned from original sources: He was called from a small country practice in Talladega, Ala., to the state health office in Montgomery in 1917 at a time when leadership in the health field was needed more than at any other. This period marked the entrance of the United States into the World War. Three great army camps were located in Alabama. Dr. Welch immediately manifested the remarkable vision which characterized his entire public health career.

The U. S. Public Health Service was called into consultation and induced to initiate a program of disease prevention in all federal reservations.

From this time forward the record of a decade shows steady advancement along all lines: Increased appropriations, additional voluntary subsidies from outside sources; enunciation of sound policies of organization and administration; successful defeat of destructive legislation; successful promotion of legislative measures necessary to health protection; wise decisions with regard to work to be undertaken and selection of staff members; the winning of friends for the health department and the confidence of worth while people in his ability as a leader; the winning of recognition for Alabama's health pro-

gram not only among her own people but among the leaders of public health thought in the United States; the cordial reception of visitors from other states and countries and the effective presentation of his programs and convictions with regard to these programs.

His was indeed a valiant spirit which could not brook defeat. His career went seemingly from peak to peak of success gained and honors won; the vales of struggle and trial were never magnified.

The deep motivating influences which shaped his life were a profound urge to bring more of health and joy to the people of his state and eventually to the world.

His every effort was directed by sound knowledge and fashioned or administered in common sense and kindness.

No labor was too heavy, no sacrifice too great, no hour too late or too long if it were needful to the completion of a necessary task.

But more than all of these must count, in the final reckoning, the fact that Dr. Welch was possessed of the power to inspire a personal love in the hearts of men coupled with a sense of devotion to the causes espoused by him.

And I say that life is indeed darkness save where there is urge;
And all urge is blind save where there is knowledge;
And all knowledge is vain save where there is work;
And all work is empty save where there is love;
And when you work with love you bind yourself to yourself,
And to one another and to God.

Anything like an adequate appraisal of the contribution to human welfare made by the life of Samuel Wallace Welch must await the commitment to this task of an inspired pen.

DOUGLAS L. CANNON,
*Acting State Health Officer,
Montgomery, Ala.*

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D.P.H.

Diphtheria Prevention in France

—An antigen entirely different from the toxin-antitoxin mixtures was proposed in France in 1923 for active immunization against diphtheria. Diphtheria anatoxin was developed and later perfected by the phenomenon of flocculation. Diphtheric toxin is converted into anatoxin by means of the combined action of formaldehyde and prolonged heat. To be called anatoxin, however, it must have an intrinsic antigen value, and must also be inoffensive toward sensitive animals.

Anatoxin does not render the subject sensitive to injections of horse serum since it does not contain a protein substance of such origin. The usual initial dose is 0.5 c.c. given subcutaneously, and 3 weeks later 1 c.c. is injected. In many instances it is unnecessary to give a third injection of anatoxin, but where required the interval between the second and third injection is about 15 days and the dosage is 1 to 1.5 c.c. During the past four years diphtheria vaccination by means of anatoxin has been performed on persons of various ages and it is estimated that a million injections have been made with no serious or fatal accident. Reactions have been mild, there being a slight reaction in from 20 to 40 per cent of cases and a strong reaction occurring in only 1 to 5 per cent of the cases. The occasional reactions are far less severe than those following other vaccinations such as vaccination against smallpox or antityphoid vaccination.

The authors cite many individual experiences in the use of anatoxin for active immunization. They conclude that two injections of anatoxin immunize

from 90 to 95 per cent of patients, and three injections from 97 to 100 per cent. Sufficient protection develops in from 5 weeks to 2 months to give a negative Schick test in those who were positive before vaccination.—G. Ramon and G. I. Helie, *Diphtheria Prophylaxis in France*, *J. A. M. A.*, 91: 1028 (Oct. 6), 1928.

Diphtheria Prevention in Virginia

—A state-wide campaign of diphtheria prevention was inaugurated in January, 1927. Physicians and nurses engaged by the state assisted local physicians in establishing clinics at which toxin-antitoxin was given. About 45,000 children were immunized in 44 counties. Later the plan was changed so as to enlist the aid of school teachers. A small fee for immunization was charged varying from 15 to 25 cents, but for those without means this service was given gratis. In 47 counties there were immunized 147,238 children. The public health nurse and the school teacher did most of the work in the rural districts. It is estimated that there are now approximately 250,000 children immunized with toxin-antitoxin in Virginia.—H. G. Grant and D. H. Anderson, *Virginia M. Month.*, Reviewed, *J. A. M. A.*, 91: 1045 (Oct. 6), 1928.

Training County Health Officers

—The need for medical health officers to man full-time rural health organizations has become acute during recent years. In Tennessee approximately one-third of the rural population is now under full-time health protection. Under the auspices of the department of preventive medicine of Vanderbilt Uni-

versity in coöperation with the Tennessee State Department of Public Health, a course of training in public health for graduates in medicine is offered at Nashville. The primary purpose is to fit graduates in medicine for positions as county health officers and no attempt is made to make specialists. The objectives are to acquaint the medical graduate with the field of public health, to inform him of the communal resources and to develop the point of view of a health officer. The course occupies a total of 12 weeks, divided into two periods of 6 weeks each. The first period is devoted to a short academic course in which public health administration, maternal and child hygiene, communicable disease, laboratory and sanitation, are considered as major subjects. The minor subjects include medical zoölogy, vital statistics, industrial hygiene, mental hygiene, graphic methods and rehabilitation of the handicapped. The second period of the course is spent in the field securing practical experience through association with a local health officer.—J. W. Mountin, *A Plan for Training County Health Officers*, *J. A. M. A.*, 91: 717 (Sept. 8), 1928.

Typhoid Fever due to Oysters—An epidemiologic study has been made of the cases of typhoid fever known to have occurred in Baltimore between October 10, 1926, and February 12, 1927. There are a total of 50 cases in the study

plus 4 additional cases reported from Baltimore County which were associated with the cases within the city. Altogether there were found to be 15 cases of typhoid fever and at least 12 cases of gastroenteritis occurring among those who partook of a supper given October 24 and an oyster roast given November 14, 1926, in Baltimore. In 8 other cases the evidence, although not conclusive, indicated that oysters were probably responsible for typhoid fever.

All cases were visited and a complete history obtained. In the case of the special supper and oyster roast, it was found that oysters were the only article of food which was common to all guests who became ill. No typhoid carrier was found among the shuckers, cooks, and waiters examined. Investigation disclosed the fact that the oysters suspected, although eaten on different occasions, came from a common source, that is, a small village, an isolated community of 700 inhabitants, situated on the seashore in Virginia. Typhoid fever was found to be present in this small community and 56 cases of typhoid fever were reported in the county where the village is located from July 1 to December 31, 1926. Sanitary conditions at the oyster plant were not good.—G. H. Ramsey, G. F. McGinnes and P. R. Neal, *An Outbreak of Typhoid Fever and Gastroenteritis Attributed to the Consumption of Raw Oysters*, *Pub. Health Rep.*, 43: 2395 (Sept. 14), 1928.

LABORATORY

C. C. YOUNG

AN OUTFIT FOR GROUP IMMUNIZATION

Including an Automatic Syringe and a Needle Rack

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THE injection of any considerable number of persons for the purpose of immunizing them against diphtheria, typhoid fever or other diseases, involves the expenditure of valuable time if accurate dosage and aseptic technic are to be maintained. If a 5 or 10 c.c. syringe is used to inject $\frac{1}{2}$ c.c. of fluid, accurate measurement of the dose is difficult. This factor is important because an inadequate dose may result in an insufficient immunizing stimulus, whereas an excessive amount may produce undesirable reactions. An accurate dose can only be obtained by using a smaller syringe, but the more frequent filling is laborious and increases the chance of contamination.

To reduce the chance of contamination to a minimum, assure accuracy of dosage, and increase the speed and ease of injection, a special syringe and needle rack have been devised.

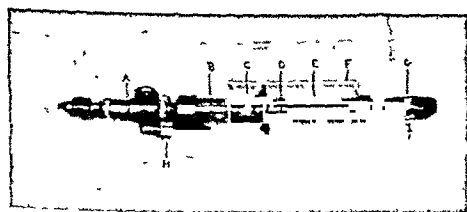


FIGURE I—THE SYRINGE

DESCRIPTION OF UNITS

The short glass barrel of the syringe (B) is equipped with a spool finger grip of metal (C) designed for the comfort of the operator. The glass plunger (D) is

equipped with a metal thumb ring-grip (G) and a dosage control (F) which regulates the stroke of the plunger so that exactly $\frac{1}{2}$ c.c. or 1 c.c. of fluid may be expelled each time. After injecting, the plunger is reset by spring tension (E). A metal cap is supplied to prevent contamination and leakage when a needle is not in place.

The vials (L) of bacterial vaccine, toxin-antitoxin mixture or other fluid are firmly held in a spring holder with weighted base (N). The metal cannula (M) is provided with an adjustable, conical, protecting cap (K). This is the first unit in a completely closed system which carries the immunizing fluid from the vial to the skin of the individual to be immunized. The cannula is connected by an adapter (J) to a convenient length of small-bore, sulphur-free rubber tubing (I), which in turn is connected to the valve device (A) with another adapter (H). Both adapters have "Vim" locks. The valve device originated with S. W. Adler. It acts on the double valve principle.

No new principle is claimed for the syringe. It is thought, however, that the application is new.

The needle rack (Figure II) consists of a circular metal disc (P) with slots (Q) in which the hubs of the needles fit. The space (S) is not slotted, thus marking the start and finish of the series of needles. The needles are placed in the rack with the bevels of the points upward. The rack rotates on a heavy

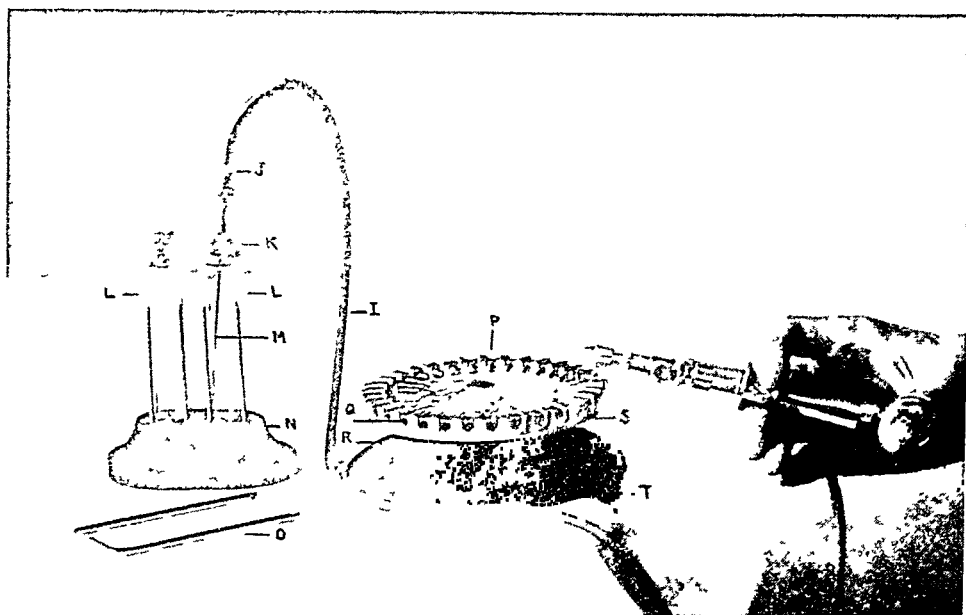


FIGURE II—THE COMPLETE OUTFIT

stand (R). The latter is provided with two lugs (T) which project over the edge of the table to prevent slipping. A convenient handle (O) is provided for carrying the rack to and from the sterilizer. It fits the commonly used Sterno outfit and the ordinary instrument sterilizer. Each rack holds thirty needles of the Vim-Luer, square hub type.

PREPARATION

The sterilization of the syringe and rack differs in no way from that of other instruments.

To maintain asepsis after sterilization, it is necessary to assemble the syringe in part, at least, with sterile forceps. First the spring is slipped on the plunger. The plunger is then inserted in the barrel, the valve attached to the syringe and the rubber tubing to the valve. The assembling is completed by joining the cannula to the other end of the rubber tubing.

A few strokes of the plunger will remove any water present. The cannula is then placed in the vial. With the

syringe held below the level of the fluid, the air is replaced by fluid with a few additional strokes of the plunger.

The operator sits at the side of the table, with the rack base conveniently located at the edge. The vial of immunizing fluid is placed in its base between the rack and the individual to be immunized, so as to avoid contamination of the needles with the rubber tubing.

THE OUTFIT IN USE

After expelling the fluid in injecting the first person, one may proceed in either of two ways:

Hold the plunger down until the used needle has been replaced in the rack and a sterile one secured. Then refill the syringe by releasing the plunger. Or, first release the plunger for refilling and then replace needle from the rack, preferably using both hands.

Holding the plunger down while changing needles becomes tiresome. The object in proceeding this way is that the thumb pressure gives added power in twisting needles on and off.

Not to hold down the plunger is easier, however. In this case using both hands gives maximum speed and power.

With either technic one needle after another is used in rotation. The double stand allows the assistant to have a full vial in place, so that when the one in use is emptied, the cannula may be shifted quickly from one to the other. In like manner, the assistant may exchange a used rack of needles with one freshly sterilized without interrupting the physician. Thus, time is saved for all concerned, but particularly for the physician.

After the last person has been inoculated, the cannula is shifted to hot water. The needles are then rinsed out, using the syringe. Thus, the needles and syringe are rinsed at the same time. Since the needles are of stainless steel, they may be conveniently left in the rack.

The actual use of this syringe has

demonstrated the following advantages:

1. Accurate dosage is automatic.
2. The chance of contamination is reduced to a minimum.
3. The speed of injection is greatly increased.
4. The waste of immunizing fluid is reduced.

The actual use of the rack has demonstrated the following advantages:

1. The chance of contamination is reduced to a minimum.
2. The speed and facility of needle change is increased.
3. The operator's fingers do not get sore from changing tightly secured needles.
4. The needles are protected from injury, thus increasing their life.
5. The beveled side of the needle is always up. (A special advantage for Dick, Schick, and other intra-dermal tests.)
6. It is a convenient place in which to store the needles.
7. The needles may be cleaned with ease and speed.

NOTE: The group immunization outfit is manufactured by the MacGregor Instrument Company, Needham, Mass.

Acknowledgments are due W. H. Brockway, John MacGregor, Arthur D. Weston, Dr. Benjamin White, and others for help and suggestions.

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

Mortality Experience of the First Six Months of 1928—Health conditions in the industrial populations of the United States and Canada during the first half of 1928 have been somewhat better than the average. They have not been as satisfactory as those prevailing during the corresponding periods of 1927 and 1921. The combined death rate for influenza and pneumonia among Metropolitan industrial policy holders was 19.8 per cent higher than last year's figure. The rate for organic heart disease among white policy holders during the first half of 1928 was 139.5 per 100,000 as compared with 130.0 during the like period of 1927, and there was a corresponding rise of the colored

from 217.4 to 239.7. There was an increase of 7.7 per cent for the colored cancer death rate. Among white policy holders the rate was only slightly higher than for the first half of 1927 or 1926.

The diabetes death rate shows an upward trend, particularly among insured urban negroes, being 19.4 per 100,000 for the first half of 1927 and 21.4 for the corresponding months of 1928. The tuberculosis death rate in the industrial population was 96.9 per 100,000 as compared with the 100.3 of 1927. Among white policy holders there was a reduction of 6.1 per cent in the death rate, but among the negroes there was an increase from 237.6 per 100,000 to 242.5. The typhoid fever death rate was lower

in 1928 than ever before, and the situation with regard to scarlet fever, whooping cough and diphtheria showed little change. The measles death rate rose from 7.1 per 100,000 to 8.6 among the whites and from 3.6 to 8.1 among negroes.

There was a drop in deaths from puerperal septicemia among colored women from 13.4 per 100,000 to 9.2. The death rate from alcoholism declined from 3.4 per 100,000 to 3.1. The record for automobile fatalities shows little change in the death rate as compared with the first half of 1927.—*Stat. Bull., Met. Life Ins. Co.*, 9: 1-5 (July), 1928.

Death Rates among Infants of Wage Earners—Infants of wage earners who are insured in the Industrial Department of the Metropolitan Life Insurance Company show very low death rates. In 1926 the Metropolitan death rate for children under 1 year was only 40 per 1,000 lives exposed to risk in contrast with the rate of 78 for the U. S. Birth Registration Area. Between the ages of 1 week and 1 month the death rate for the Metropolitan infants was 146 and that for the registration area 156. The death rates between 1 and 3 months are distinctly lower for children of the Metropolitan policy holders than for those in the birth registration area. After 3 months of age there is not much difference in the rates, and between 6 months and 1 year the rates for both groups are substantially the same, being 27.9 and 27.8.—*Stat. Bull., Met. Life Ins. Co.*, 9: 5-6 (Aug.), 1928.

Age Distribution of Diseases in Relation to Latitude—Deaths from measles, diphtheria, scarlet fever, whooping cough and poliomyelitis tend to be more concentrated in the early years of life as the aggregation of population is increased. For measles and whooping cough, this tendency seems to be inde-

pendent of climate or latitude. In Rhode Island with an urban population of 97.5 per cent, the index of age distribution of deaths from measles is 26. In Ohio with an urban population of 63.8, the index is 5.53. In Oregon with 49.9 per cent urban population, the index is 2.41. For Mississippi with an urban population of 16.6 per cent the index is 1.25.

The age distribution of deaths for scarlet fever, diphtheria and poliomyelitis has a higher concentration in early childhood in warm than in colder climates. In the northern and western parts of the country the age distribution of deaths from these diseases is related to aggregation of population in nearly the same degree as with measles. But in the southern states, despite the sparse population, the deaths from these diseases are concentrated in the early years of life. Thus in Maine, the median age of death from diphtheria is 4.9 years, and in Louisiana, with nearly the same proportion of urban population, the median age is 2.89 years. The per cent of deaths under 5 years from measles is 93.70 for London, 93.35 for New York, 87.38 for Rio de Janeiro and 86.67 for Manila; whereas death rates from diphtheria are 60.91, 71.58, 80.95 and 91.79, showing the highest indices of age concentration for the smaller tropical cities.—James A. Doull, *Variations in the Age Distribution of Mortality and Morbidity from Diphtheria, Scarlet Fever and Certain Other Diseases in Relation to Latitude*, *Am. J. Hyg.*, 8: 633-647 (July), 1928.

Diabetes—A study of two thousand diabetic cases was made in Cleveland between March, 1921, and November, 1927. The incidence of diabetes among patients admitted to the clinic during this period was 2.28 per cent, 46.8 per cent of the diabetic cases being male and 53.3 per cent female. There was a hereditary history of diabetes in 5.3 per

cent and a familial history in 4.5 per cent of the cases. Glycosuria was found in 159 patients with blood sugar below 180, and in 26 with blood sugar 120 or below. Glycosuria was not found in many patients in the presence of high blood sugar, the highest blood sugar level without glycosuria being 390 mg. per 100 c.c.

The general belief that insulin if once used must always be continued is fallacious. In a number of cases from 4 to 76 years of age where the use of insulin was discontinued from 5 to 72 months, the blood sugar content either remained within normal limits or showed a slight rise. Insulin reactions are not wholly due to hypoglycemia, but are found frequently in the presence of hyperglycemia as noted in a case where the blood sugar at the time of insulin reaction was 467 mg. per 100 c.c. Many normal persons have a blood sugar content as low as from 30 to 40 mg. per 100 c.c. The total number of patients with diabetic coma in the series was 85, or 4.3 per cent. Among 59 of these 81.4 per cent lived and 18.7 per cent died. The incidence of syphilis in the entire series was 2.7 per cent. The total mortality was 131, or 6.55 per cent.—Henry J. John, *Arch. Int. Med.*, 42: 217–247 (Aug.), 1928.

Decline in Tuberculosis Mortality

—Figures show that in those countries where coördinated measures against tuberculosis have been continuously applied throughout a sufficiently prolonged period, there is a striking decline in mortality from tuberculosis. The accelerating drop in the tuberculosis death rate greatly exceeds the drop in mortality from all diseases throughout the same period. During the fifty years between 1871 and 1921 the death rate from tuberculosis in Scotland was re-

duced by two-thirds, while that from all diseases was reduced by less than one-half.

In England a comparison of the death rates for several years shows a drop of 14 per cent between 1871 and 1881; in 1891 the death rate had decreased 15 per cent; in 1901 there was a drop of 19 per cent; in 1911 the rate decreased 21 per cent; and during 1921, 20 per cent. Similarly for Scotland the 1881 death rate shows a drop of 17 per cent; that of 1891 a drop of 21 per cent; and that of 1921 a drop of 31 per cent. In Ireland there was an increased tuberculosis death rate of 6 per cent in 1881; a 2 per cent increase in 1891 and 1901; a decrease of 20 per cent in 1911; and a decrease of 25 per cent in 1921.

In Scotland, the deaths from pulmonary tuberculosis in 1871 constituted 11.8 per cent of deaths from all diseases; in 1901 they were 8.7; and in 1921, 6.2 per cent of deaths from all diseases. Likewise in England the pulmonary tuberculosis deaths in 1871 were 10.5 per cent of deaths from all diseases; they were 7.5 per cent in 1901; and 7.1 per cent in 1921.

There was also a decline in the tuberculosis death rate in other countries. In Denmark the mortality rate for 1901 was 210 per 100,000, and in 1922 it was 95 per 100,000. In New York, taken as a representative of antituberculosis work in the United States, the death rate for 1907 was 238 per 100,000, and in 1921, in spite of an increase of a million and a half in population, the death rate from tuberculosis was 106 per 100,000. In France, before the war the death rate was about 400 but in 1921 at the beginning of the antituberculosis movement it was 286.—Sir Robert Philip, *Causes of the Decline in Tuberculosis Mortality*, *Pub. Health*, 41: 336–344 (Aug.), 1928.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

Demonstration of Vacuum Degasification Process for Sewage Settling Tanks—Sewage plant troubles, especially with reference to odors and foaming, were discussed at the sewage field conference held in Cleburne, Tex., August 27, called by Dr. F. E. Giesecke, director of sewage research, A. & M. College, College Station, Tex., and Dr. J. C. Anderson, State Health Officer, Austin, Tex. More than fifty towns were represented by the 130 registrants who gathered to discuss and examine the new vacuum degasification process recently installed at the Cleburne sewage disposal plant by T. B. Sims, superintendent of city water and sewage department, and James G. Taylor, city water commissioner.

Ever since the first information was given out about the unusual results from this process, inquiries have been coming in to the engineering division of the State Department of Health from mayors, city managers, sewage plant operators, chemists, engineers, and others interested in the all-absorbing problem of stream pollution and sewage disposal.

The discussions developed, after inspection of the plant, were practically unanimous in favorable comment as to the extensive results accomplished. A cross-section of the opinions expressed gave special attention to:

1. The unusual clarity and excellent physical appearance of the effluent after treatment with the vacuum degasification arrangement
2. Simplicity of the automatic vacuum degasification pumping device in the dosing chambers
3. The daily gravity removal of the sludge from the surface of the Imhoff gas vents, reversing normal withdrawal of the sludge from the bottom of the tanks
4. Hastening of digestion by producing more

favorable conditions for bacterial action through continuous removal of gases as they are formed

5. The noticeable absence of offensive odors from units in the plant, more especially the lagoons, containing the sludge removed from the surface of the Imhoff tank

Generally it was agreed that the process is accomplishing some improvement. However, it was also evident that the biggest task is to extend studies in determining physical and biochemical reactions in the tank created by the constant vacuum, all of which is necessary to determine the design, shape, and size of tanks more workable for this process. Work has already been started at the A. & M. College sewage experiment station under the direction of Professors F. E. Giesecke and E. W. Steel for extending these studies in coöperation with the engineering staff of the State Department of Health. Assurance has also been given, through Dr. E. P. Schoch, of the University of Texas extending research work in perfecting this process.—State-wide Sewage Field Conference Held at Cleburne, Tex., Aug. 27, 1928.

River Pollution—In the January, 1928, issue of the JOURNAL (p. 71), there appeared an editorial on the sanitation of waterways, in which was mentioned the desirability of further coordinating efforts to solve the rivers pollution problem in England through the appointment of a joint administrative advisory committee and of a research board. In the September 20, 1928, issue of *Water and Water Engineering* the first report of the joint advisory committee is given.

This joint committee, which is reporting to the minister of Health and the

minister of Agriculture and Fisheries, undertook its task by first considering the question of "the machinery best suited to administer the law with regard to the pollution of rivers and streams." A review of the acts which convey authority to enforcing agents for the abatement of river pollution is then given. The authority seems to be ample, but pollution of waterways continues.

The committee has received evidence to the effect that to prevent pollution "a body specially charged with the administration of the Acts and acting throughout the whole or the greater part of a river basin is far more effective than a body operating in a limited area and occupied with a large variety of other work." Further, proper administration can be secured only when the body in authority has supervision over a river as a whole, including its tributaries. Another conclusion of interest is that the area under jurisdiction of any rivers board should be sufficiently large to permit the employment of skilled officers, but still not so large as to make it impossible for the chief officers to keep themselves informed as to the existence of any pollution.

Effect of Salt on Sludge Digestion

—This paper treats of the effect of increasing amounts of sodium chloride upon the rate of organic decomposition in sewage sludge by bacteria and shows that it is, progressively, (a) indifferent, (b) stimulating, (c) retarding, and (d) toxic.

The author gives tables and charts showing the effect of sodium chloride on domestic sewage sludge in mixtures of 2, 5, 10, and 20 gm. per liter of sludge containing 1 part of ripe sludge to 2.3 parts of fresh solids. He concludes that the effect of salt upon the rate of decomposition of sewage sludge is only slightly noticeable with the addition of 5 gm. per liter of sludge, but with larger amounts the destruction of volatile mat-

ter and total gas production decrease markedly. The composition of the gas changes greatly with the addition of salt; with the larger quantities of salt practically no methane is produced. Mixtures of salt and sulphates appear to be somewhat stimulating.—Willem Rudolfs, *Pub. Health Rep.*, 43: 874–881, 15 (Apr.), 1928. Abstr. O. C. Hopkins.

Treatment of Slaughterhouse Waste in Holland—The important features of the plant which treats a small quantity, 30,400 gallons, of strong slaughterhouse wastes are: (a) surface aeration produced by revolving street brushes which are submerged from $\frac{1}{4}$ to $\frac{1}{2}$ inch in the liquid. Submerged wooden paddles keep currents moving; (b) great reduction in volatile matter, oxygen consumed and alkalinity and considerable formation of nitrates. Reduction in alkalinity is 68 per cent. American results taken from *Public Health Bulletin No. 132* range from 19.5 per cent to 27.5 per cent reduction for domestic sewage; (c) flexibility of operation; aeration can be increased by dipping the brushes a little deeper; and (d) low construction and operation costs are claimed.—Willem Rudolfs and H. Kessener, *Pub. Works*, 59, 4: 151–154 (Apr.), 1928. Abstr. L. M. Fisher.

The Relation of the Type of Soils of Alabama to the Distribution of Hookworm Disease—Earlier experimentation with soils in Porto Rico and Maryland had demonstrated distinct differences in the percentage of hookworm ova that develop to infective larvae in humus, sand, loam and clay. With this as a clue, soils representative of the different soil belts in Alabama were tested in the laboratory to determine their effectiveness in rearing larvae. Typical sandy soils permitted a yield of infective hookworm larvae averaging 43 per cent of the ova introduced, whereas for clay soil the average was closer to 5

per cent, the degree of efficiency of the soils being "directly related to their textures." Hookworm surveys on children from different parts of Alabama showed that the incidence is greatest in the two sandy provinces, the Upper and Lower Coastal Plains, and that hookworm disease is largely limited to the latter. Light infestations were constantly encountered among children who had lived all or nearly all their lives in soil provinces in which fine, heavy clay soils predominate, but in no instance did these children have heavy infestations.—D. L. Augustine and W. G. Smillie, *Am. J. Hyg.*, 6: 36-62 (Mar. supplement), 1926. Abstr. N. R. Stoll.

Treatment of Vegetable Refuse: A New Process—Incoming vegetable matter is first pulverized; the pulped mass is delivered continuously to a separator where heavy foreign matter, such as glass, settles out in agitated water. The vegetable matter is then drained on moving copper gauze, which conveys it to heavy rolls for complete crushing. A second pair of rolls removes the free water, leaving the material comparatively dry. A readily salable and hygienic product forming a valuable addition to agricultural economics is produced.—Anon., *Surveyor*, 73, 1885: 297 (Mar.), 1928. Abstr. W. M. Olson.

Town Planning in Sweden—Although there are only some 120 towns in Sweden, fixed plans have been in use since the beginning of the 16th century. Perhaps the first building and town planning law applicable to an entire country was the law passed in Sweden in 1874 which "embraced only the technical regulation for the planning and building of towns in conformity with the requirements of hygiene, comfort, communication and protection from fire." Some 4,000 plans have been made since the passage of this law.

The town plan was adopted by town authority, with final approval except in minor cases resting with the King. The plan was usually drawn on a scale of one-two thousandth part of the actual dimension and included a topographical map. General building regulations such as building height, zoning, financing, and law enforcement were definitely provided in law of 1907, which influenced to some extent the English Town Planning Act of 1909.—A. Lilienberg, *Surveyor*, 73, 1892: 465-466 (Apr.), 1928. Abstr. F. J. Lavery.

Industrial Waste Work of the Sanitary District of Chicago—This article sums up the results and recommendations of studies and tests made on the three major industrial wastes produced in the Sanitary District. These wastes are classified as packing house, tannery and corn products. Chemical industrial wastes from the Sherwin-Williams Paint Company are discussed also.

The Stockyards Testing Station was operated from 1912 to 1918. Studies were made of fine screening, sedimentation, chemical precipitation, trickling filters and activated sludge. Best results were obtained by activated sludge treatment. An aeration period of 9 hours and 3.5 cu. ft. of air per gal. were required. Activated sludge was filter-pressed in a recessed-plate press.

The Tannery Testing Station was built in 1920 and operated several years, and included tanks and filters for studying fine screening, sedimentation, activated sludge treatment, cinder and sand filters and filter pressing of sludge. Results tend to show that biological treatment would be uneconomical and inadvisable for the 30 tanneries on the North Branch, but screening and sedimentation should be accomplished at most of the individual houses. Further study on the use of alum as an aid to sedimentation is being made.

The Corn Products Testing Station

was built at Argo in 1920 and operated to 1926. Sedimentation tests were made in an Imhoff tank, but the removal of suspended matter was practically negligible, and settling did not seem to be of any benefit for further treatment biologically. The activated sludge process was not satisfactory. A trickling filter 7.5 feet deep gave satisfactory effluents at rates of 700,000 gallons per acre per day, and stood overloads in concentration more successfully than the activated sludge process. Trickling filters were recommended as the most successful type of treatment.

Attention was also given to the possibility of recovery of some of the waste products in the factory. A remarkable reduction of wastes occurred in 1926 when all of the waste waters from the starch and gluten settlers were returned to the process, recirculated and finally removed as a valuable feed. This recovery of wastes has reduced the treatment problem to 18 per cent of its original size.—F. W. Mohlman, *Water Works*, 67, 4: 163-166 (Apr.), 1928. Abstr. R. J. Faust.

Removal of Phenol Wastes from Gas Plants—The Rochester Gas and Electric Corporation cooperating with the City of Rochester, N. Y., and the State Department of Health experimented with the addition of phenol-bearing wastes from ammonia stills to city sewage. One part of waste was diluted with 1,000 parts of sewage. The mixture was circulated for 3 hours in a closed system, to simulate the flow through a sewer. A reduction from 5.3 p.p.m. to 5.0 p.p.m. of phenol occurred, indicating that the destruction or absorption of phenol by the raw sewage was slight. The alkalinity, pH and bacterial flora were virtually unchanged.

A mixture of the same proportions was treated in the one-half million gallon Imhoff tank disposal plant at Char-

lotte for 10 weeks. A well digested sludge, easily dewatered, was obtained. The pH was constant, free ammonia increased, number of bacteria increased, and grease and sulphur trioxide decreased in the sludge. It is concluded that "the addition of the ammonia still waste to sanitary sewage in the rate of 1-1,000, thereby adding about 2.2 p.p.m. of phenol, can be carried on successfully with no deleterious effect upon the sludge digestion and plant operation of Imhoff tanks." The absorption of phenol in the Imhoff tank is negligible.

The amount of phenol removed by trickling filters and by both Imhoff tanks and trickling filters was found to vary with the concentration of phenol. The following table summarizes the data presented:

TRICKLING FILTERS

(Sanitary sewage normally having 3.0 p.p.m. phenol)

Ratio of waste to sewage	none	1-210	1-420	1-880
% phenol reduction	26.7	24.3	38.3	28.9

IMHOFF TANKS AND TRICKLING FILTERS

(Sanitary sewage normally having 3.6 p.p.m. phenol)

Ratio of waste to sewage	none	1-210	1-420	1-850
% phenol reduction	42.9	35.1	42.7	31.1

Conclusions: In large Imhoff tank plant operations, ammonia still wastes may be added to sewage at a ratio of 1-2,000 with no ill effects upon operation, but only a relatively small amount of phenol, if any, is destroyed. Those treatments employing oxidation, such as trickling filters, produce a varying amount of phenol destruction.—Louis Shnidman and Linn B. Bowman, *Gas Age-Record*, 61, 18: 626-628 and 634 (May), 1928. Abstr. J. I. Connolly.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

The Lessening Menace of Benzol Poisoning in American Industry— This contribution presents a very interesting résumé of the present status of the use of benzol in industry. Dr. Hamilton reviews the practice in those industries which was regarded as being the chief users of benzol, namely, rubber, artificial leather, sanitary can manufacture, dry cleansing and the paint industries. It is pointed out that in the rubber industry benzol cement is being largely replaced by rubber latex, that is, the uncoagulated juice of the rubber tree. In the artificial leather industry toluol has, to a very large extent, replaced benzol, while in the making of sanitary cans rubber latex is used in order to render the cans air-tight. In the dry cleaning industry "Stoddard's Solvent," as well as ordinary naphtha, has come into use, while in the paint industry toluol is largely substituted for benzol. It is, of course, not to be understood that benzol is exclusively eliminated from the previously mentioned industries.

Dr. Hamilton points out that it is the belief of many insurance and industrial officials that benzol will be replaced eventually by other non-injurious materials.—Alice Hamilton, *J. Indust. Hyg.*, X, 7: 227 (Sept.), 1928. L. G.

A Case of Hematuria from Shoe Dye Poisoning—Shoe dyes have been the causative agent of blood pathology. In a recent article, Haft (*J. A. M. A.*, March 10, 1928) notes some 61 cases reported in the literature. The present report deals with a case of shoe dye poisoning complicated with hematuria. This case occurred in a student, aged 17,

who wore freshly dyed shoes but seven hours. Cyanosis and headache were the chief symptoms. The following day the urine presented a clear, dark, amber appearance, changing two days later so that it then presented a completely bloody picture. At the end of five days of treatment no red blood cells could be found microscopically in the urine. Analysis of the shoe dye revealed aniline to be the source of the poisoning.—O. J. Schmitt, *J. A. M. A.*, 91, 10: 726 (Sept. 8), 1928. L. G.

Effect of Antiseptic Sprays on the Bacterial Content of Air—In the series of studies here reported *B. coli communis* was used as a test organism. The bacteria were grown in large quantities and then made into a homogeneous emulsion with 4 parts of saline to 1 part of culture. Measured portions of this emulsion were sprayed into a room of approximately 5,000 cu. ft. content, the windows and doors being closed throughout the studies. The spray was directed into the blast of a powerful electric fan and so dispersed throughout the room. Ten minutes after the onset of spraying, that is, about 9 minutes after spraying was completed, agar plates were exposed for a period of 2 minutes at various locations in the room. When antiseptics were being tested these were sprayed during two periods of a duration of 1 minute each in the interval between bacterial dissemination and plate exposure.

It was found as a result of these experiments that the two antiseptics tested exerted a real bactericidal effect. In general, it was found that this effect depended upon many factors, the most important of which were the antiseptics

used, the degree of dilution, and "the age, exposure, etc., of the antiseptic."

It is pointed out in conclusion that the use of antiseptic sprays in crowded workrooms is justified but that the experimental conditions utilized in this study must be borne in mind in a consideration of this problem.—S. R. Douglas, Leonard Hill, and Wilson Smith, *J. Indust. Hyg.*, X, 7: 219 (Sept.), 1928. L. G.

Moffat Tunnel Ventilation for Steam Locomotives (See paper entitled "Ventilation Experiments in the Moffat Tunnel," by McElroy and Betts, *Engineering News-Record*, Vol. 99, No. 24, December 15, 1927)—The Moffat Tunnel on the Denver and Salt Lake Railway is approximately six miles long. It was found necessary to provide ventilation in order to reduce the temperature and smoke content of the tube while in use. Two fans are provided, one as a reserve unit. These are located in the east portal of the tunnel. The design provides for a current of air, moving at a velocity of 10 to 14 M.P.H. in a direction opposite to that of the motion of the train. A unique portion of the equipment is the arrangement of dampers so as to yield an east or west bound air current as desired. This is accomplished by means of gates, 16x24 ft., operated by 3 H.P. motors, geared to an operating pinion which engages a curved rack on the gate frame. By the proper opening and closing of these gates it is possible to effect either an east bound or west bound air current as desired. It is to be noted that with such a scheme as this the smoke is carried along the full length of the train, instead of being blown or drawn ahead of the locomotive. With the present equipment it would, of course, be necessary to keep the train speed from 10 to 14 M.P.H., in order to avoid this. Such a slow speed is undesirable. On the other hand, to increase the velocity of the air

current to 20 M.P.H., in order to permit a train speed of 15 to 18 M.P.H., would require a power plant of more than 4,000 H.P., which would be far from economical.—*Eng. News Rec.*, 100, 26: 994-995 (June 28), 1928. L. G.

The New Factories Bill—This contribution discussed briefly some of the provisions of the new Factories Bill which is expected to come before the next session of the British Parliament. It is expected that the provisions of this bill will make conditions in British factories more congenial, and solve to some extent the strained relations between capital and labor. In general, according to the author of this paper, it seeks to remove from the control of the local authority much work which he has conducted since 1901.

The local authorities will continue to exercise certain rights of entry, and in particular in the preparation, manufacture and packing of food the responsibility rests largely with the local authorities. It is to be noted, however, that if this bill becomes law it will be the first piece of legislation which has removed any premises except crown buildings from the control of the local authorities.

One section of the bill deals with the amount of cubic space required per worker and increases the requirements from 250 to 400 cu. ft. It also provides that only 14 ft. of ceiling may be considered in making this computation.

The heating standard required by the new legislation is 60° F. The installation of thermometers is a requirement of the law. Ventilation is dealt with by the requirement that "a constant supply of fresh air must be provided in each workroom." Lighting is discussed in one section of the new law, not quoted except that it is required that windows and skylights be kept clean.

It would appear that there is considerable overlapping of the work of the fac-

tory inspector and the sanitary inspector, a fact emphasized by Mr. Raimes.

It seems obvious, also, from the contents of this paper, that certain of the items in the legislation might with advantage be more clearly defined, such as, for example, "sufficiently lighted and ventilated" and "conveniently accessible."—C. Raimes, *J. Roy. San. Inst.*, XLVIII, 10: 577–580 (Apr.), 1928.

L. G.

Method of Action of Silica Dust in the Lungs—After a review of the literature bearing on this subject, the authors of this paper conclude that silica is a constituent of many plant and animal tissues and that the silica ion is not toxic to animals. Moreover, silica in stable combination and crystalline silica appear to be harmless. It is colloidal silica which is harmful, and the opinion of the writers of this contribution is that silica is harmful chiefly because of its powerful colloidal properties.—P. Heffernan and A. T. Green, *J. Indust. Hyg.*, 10, 8: 272–278 (Oct.), 1928.

L. G.

Inhalation Experiments with Certain Lacquer Solvents—This paper presents the results of studies on the effects of various solvents used in paints and lacquers on the test animals exposed to them. The substances studied were toluol, xylol, gasoline, ethyl acetate, butyl acetate, amyl acetate, ethyl alcohol, butyl alcohol, steam distilled turpentine, and spraying lacquer distillate. Guinea pigs were used as the test animals. They were exposed in the gassing device by means of which known concentrations of gas could be continuously fed to the chamber. Observations and studies were made on the weight of the animals, their blood characteristics, and the urine. As a result of this study the

authors have divided the substances tested into three groups as follows:

1. Those usable with safety in concentrations usually employed or possibly in somewhat higher concentrations as ingredients of brushing or spraying lacquers. Ethyl acetate and amyl acetate, and possibly butyl acetate, would be placed in this class.

2. Those usable with safety in present concentrations but to be increased with caution as possibly harmful if increased materially. Here would be listed gasoline, turpentine, and xylol.

3. Those for which the present practice probably represents nearly the upper limit of safety in use as spraying lacquer constituents. In this group are toluol and butyl alcohol.—H. F. Smyth and H. F. Smyth, Jr., *J. Indust. Hyg.*, 10, 8: 261–271 (Oct.), 1928.

L. G.

The Gravimetric Determination of Dust Inhaled by Workmen—In the making of determinations of the dust content of the atmosphere of work places, the sampling apparatus is usually set up at the proper point, and by means of a fan or suction device the room air is continuously drawn through the appropriate dust filter. To the author of the present paper this seems to be a fallacious procedure, chiefly for the reasons that the human being inspires and expires in an orderly sequence. The sampling instruments do not therefore simulate actual conditions. Further, the position of the sampling tube and the direction of the flow of air constitute important considerations in his mind. For these reasons he has devised the instrument described in this article. The instrument is so arranged that it may be attached to a person's head. Two tubes are placed in the nostrils, and the inhalation of the air filters it through the cotton or glass wool which constitutes the filtering medium.—A. I. Burstein, *J. Ind. Hyg.*, 10, 8: 279–291 (Oct.), 1928.

L. G.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Destruction of Botulinum Toxin by Milk Bacteria—Attention is directed to the fact that botulism is very rarely attributed to the consumption of milk and milk products contaminated with *Cl. botulinum*. Although fresh milk may ordinarily be used before bacterial growth has been sufficiently extensive to be dangerous from the standpoint of botulinum poisoning, such is not the case with cheese and certain other milk products. The exclusion of cheese as an agent in the dissemination of botulism cannot be explained by the inability of *Cl. botulinum* to grow in the product because of its acidity, since in many types of cheese the reaction is not sufficiently acid to inhibit the growth of this organism. In this paper it is shown that botulinum toxin is destroyed by *S. lactis*, *Lactobacillus casei* and *Proteus vulgaris*, which are organisms occurring in milk and milk products. The authors here previously demonstrated that *B. coli*, *B. communior*, *B. aerogenes* bring about destruction of botulinum toxin. It is believed that these results explain in part the fact that milk and dairy products are seldom if ever agents in the dissemination of botulism.—J. M. Sherman, C. N. Stark, and Pauline Stark, *J. Dairy Sci.*, 11: 352 (Sept.), 1928.

The Bacterial Content of Orange Sherbet—Ices or sherbet mixes, which have been made from high-grade products, should contain very few bacteria before processing. If processed in clean equipment and carefully aged at low temperatures, the bacterial content of the finished product should also be relatively low. If the bacterial content

of a sherbet or a water ice is high, the most likely sources of contamination are poorly washed utensils, improper aging temperature, or, in case of a sherbet, the addition of ice cream mix or dairy products of poor quality. In this paper results are given to show the bacterial content of 21 samples of orange sherbet manufactured in Kansas, Missouri and Nebraska and representative of the product sold in the middle west. The plate counts per gram of sherbet ranged from 80 to 1,100,000. Only 2 samples contained bacteria in excess of 100,000 per gm. and 13 samples contained less than 10,000 bacteria per gm. The 6 remaining samples contained between 15,000 per gm. and 64,000 per gm. In view of the limited information at hand, it would not be feasible to suggest any definite figure as a basis for judging the bacterial content of sherbets. The relatively low bacterial content of a water ice or sherbet enables the detection of equipment contamination of lesser magnitude than would be possible with other products such as ice cream or milk. In regard to pasteurization of water ice or sherbet mix the author states that, although the pasteurization of these products may not be so imperative as it is for ice cream mix, the process is sufficiently advantageous to more than justify its adoption.—A. C. Fay, *J. Dairy Sci.*, 11: 404 (Sept.), 1928.

A Defect in Milk Due to Light—It has been observed that an "off" flavor develops in milk which has been kept in an outdoor icebox, frequently an open box, or directly exposed to sun-

light and daylight on a windowsill. Previous investigators having reported the production of a "tallowy" flavor on exposure of milk to direct sunlight, this investigation was conducted using diffused light to determine to what extent this produced in milk the "tallowy" or "cardboard" flavor. Duplicate samples were employed, kept in flasks or bottles stoppered with cotton or covered with paper, one sample being kept in the dark during the experiment. Temperatures employed were just above freezing. Characteristic cardboard flavor developed in samples exposed to daylight for 8 to 26 hours. No flavor developed in the sample kept dark. Skim milk in contrast to whole milk or cream does not develop the "off" flavor. Pasteurized samples developed the objectionable flavor more rapidly than raw milk. The reaction which develops without the aid of enzymes or bacteria appears to be due to the catalytic action of light.—William C. Frazier, *J. Dairy Sci.*, 11: 375 (Sept.), 1928.

The Effect of Ethylene upon the Vitamin B Content of Celery—In this experiment young rats of the same litter were paired closely as to weight and placed on a vitamin-B-free diet. Ethylene treated and board-blanching celery were fed in known quantities and check animals from each litter maintained. The results did not indicate that either method is superior in conserving food value although it was shown that ethylene is not injurious to the vitamin B content of celery. This work is interesting in view of its bearing on the commercial use of ethylene gas to effect the ripening of tomatoes and other fruits and vegetables.—M. F. Babb, *Science*, 68: 231 (Sept. 7), 1928.

The Copper Content of Milk—The varying amounts of copper found in milk by investigators in different lo-

calities has suggested the possibility of the influence of the copper content of native feeds. Milk was collected from 4 states—Iowa, Montana, South Dakota, and Kentucky—and analyzed, the copper content varying from 0.26 to 0.52 mg. per liter. The copper content of milk from a herd of Toggenburg goats was found much lower than cow's milk, ranging from 0.19 to 0.25 mg. per liter, while sheep milk was found to contain about the same amount of copper as cow's milk, 0.45 to 0.50 mg. per liter. Four common brands of condensed or evaporated milk were found to contain copper in greater amounts than probably occurred in the original raw material. This variation can be traced to the amount of copper surface exposed to the milk product. The possibility of contamination with copper during analysis was always checked by means of equivalent quantities of copper-free water which were treated in the same manner as the milk, and copper was determined by the xanthate colorimetric method as modified by Supplee and Bellis (*J. Dairy Sci.*, 1922, v. 455). It is apparent that the variation in copper content of native feeds, such as the grass in Kentucky, has little or no effect.—G. N. Quam and Arthur Hellwig, *J. Biol. Chem.*, 78: 681 (Aug.), 1928.

The Influence of the Administration of Aluminum upon the Aluminum Content of the Tissues, and upon the Growth and Reproduction of Rats—Rats on adequate normal diet were fed 2 mg. aluminum as potassium aluminum sulphate per rat per day in biscuit for 100 days. The rats were killed and the organs analyzed by a colorimetric method devised by the authors (*J. Biol. Chem.*, 78: 595 (Aug.), 1928). Control rats showed small amounts of aluminum in the organs which were but slightly increased in those rats which were re-

ceiving daily doses of the aluminum compound. The difference is most apparent in the liver and brain tissues. The intraperitoneal injection of 4 mg. of aluminum had no ill effect on the rats and the analyses of their tissues showed marked increase in the aluminum content of the liver. Rats on a diet made as free from aluminum as possible were analyzed, results showing small amounts of aluminum still present. The administration of 2 mg. of aluminum covered four generations of rats during which time the growth and reproduction curves compared well with controls, indicating that the addition of aluminum to the diet had little influence.—V. C. Myers and James W. Mull, *J. Biol. Chem.*, 78: 605 (Aug.), 1928.

A Comparison of Certain Methods for Determining the Sanitary Quality of Ice Cream—It is pointed out in this article that there are three bacteriological tests available for determining the sanitary quality of ice cream: (a) total count of bacteria; (b) colon group test; and (c) anaerobic spore test. A comparative study of the three methods is reported. A total of 124 samples of commercial ice cream was obtained from producers and retailers in Seattle, Wash., and examined by these three bacteriological methods. The factory samples (24) gave low counts, 87 per cent under 100,000 and 100 per cent of them under 500,000. Of the dispensers' samples (100) only 31 per cent fell below 500,000, while 69 per cent were above. Since most of the ice cream dispensed was produced in the factories considered, and since 94 per cent of the samples were pasteurized, it appears obvious that there was a tremendous increase after the product left the factories, due either to multiplication or contamination, or both. The total count reveals the results of contamination and of subsequent multiplication of the bacteria introduced, but

it does not distinguish between the two. It was found that 92 per cent of the factory samples contained less than 10,000 organisms of the colon group per c.c. while only 68 per cent of the dispensers' samples contained less than 10,000 per c.c. The colon group test functions like the total count, but it is somewhat more specific in indicating insanitary conditions. It was found that 4 per cent of the factory samples and 14 per cent of those from dispensers contained anaerobic spores in 3 out of 5 tubes inoculated with 1 c.c. of ice cream. The anaerobic spore test shows insanitary conditions only but in the case of ice cream it fails to distinguish between the spores introduced through insanitary conditions and those added with the sugar. For freshly pasteurized products the first two methods are useless except for controlling pasteurizing efficiency; they have distinct value for testing subsequent contamination; the last method reveals contamination in both pasteurized and unpasteurized products.—John Weinzirl and L. S. Harris, *J. Dairy Sci.*, 11: 284 (July), 1928.

The Influence of the Administration of Aluminum upon the Aluminum Content of the Tissues of the Dog—Dogs on a normal diet were found to contain small amounts of aluminum distributed in the liver, heart, kidney and spleen. Dogs administered 230 mg. of aluminum daily for 90 days were killed and the tissues analyzed. Figures showed little difference in the aluminum content over those on the normal diet and these experiments included two dogs which had been fed 7 gm. of aluminum phosphate daily. The most notable increase in aluminum was in the case of the liver, an average of 0.27 mg. aluminum per 100 gm. against an average of 0.15 mg. for the control. Seventy mg. of aluminum administered intravenously and intra-

peritoneally in 5 mg. daily portions remained in the tissue for a long time, a marked increase in aluminum content being found in 8 and 34 days after the last administration. It is concluded that when aluminum is present in the tissues it is slowly excreted and that when aluminum compound is administered orally to dogs the absorption of aluminum is very slight.—V. C. Myers and Dempsey B. Morrison, *J. Biol. Chem.*, 78: 615 (Aug.), 1928.

The Solubility in the Stomach and Duodenum of Aluminum Compounds Found in Baking Powder Residues—To answer the question as to whether the residues in biscuits made from aluminum baking powder are dissolved in the human subject, experi-

ments were undertaken in which test biscuits composed of 100 gm. of aluminum baking powder biscuit with 400 c.c. of water were given. Eighteen subjects were studied in which it was found that the gastric contents in soluble form contained from 2 to 20 per cent of the aluminum administered. In 6 of the subjects the total aluminum was determined and the soluble aluminum on an average was found to be 25 per cent of that administered. The duodenal contents of 4 subjects were examined, indicating solubilities of 10.7 to 29.9 per cent. Figures led to the conclusion that if aluminum is absorbed this absorption probably does not take place in the stomach.—V. C. Myers and John A. Killian, *J. Biol. Chem.*, 78: 591 (Aug.), 1928.

CHILD HYGIENE

MERRILL E. CHAMPION, M. D.

Special Supervision for Non-gainers—In an institutional group of underweight children usually there are a certain number who refuse to gain despite the regular routine under which the majority gain. With such a group as this, at the Ridge Farm Preventorium, intensive study was carried on to find out, if possible, the causes of failure to gain; methods of changing diet and activities to cause a gain; and, lastly, to formulate suggestions for the preventorium to carry out for further treatment of similar cases.

Of the 10 children studied, 8 had physical defects of some description which might handicap their gaining. Since these could not be corrected at this time, methods of diet and hygiene were planned. The 10 girls were not eating a sufficiency of foods principally because of an inconsistent intake.

Over a period of days, the amount of food eaten varied considerably from day to day. Sleep was inadequate, not because of the plans of the preventorium but rather because the children were not actually sleeping during the allotted number of hours.

With these conditions apparent, the caloric value of food eaten was increased, not only by quantity of servings, but also by the use of concentrated foods. The intake was so regulated that the daily amount necessary was furnished. More relaxation and more hours of sleep were planned. Under such a program, the children made at least double the expected gain, except in one case. Through this type of study with difficult gainers, it is evident that direct supervision over this group is of great value. Remembering that most of the children had physical

handicaps and that these might be a factor in their resistance to gains, it is advisable to require correction of physical defects before admittance to a preventorium. If this provision is not made, it would be economical for the institution to employ a special worker to supervise the group of those not "free to gain."—Nellie Hord and Lydia J. Roberts, Ph.D., Results of Dietary and Hygiene Control of Ten Non-Gaining Preventorium Children, *J. Am. Dietetic Assn.*, IV, 2 (Sept.), 1928.

Maintaining a Clean Mouth—

Few people use the toothbrush conscientiously; that is, their thoughts are not concentrated upon what they are doing, but are far away planning their day's work, and they brush energetically only those areas which are most accessible. The length of time consumed in the toilet of the mouth also depends entirely upon how early the individual has arisen; if he is in a hurry, the brushing of the teeth is that part of the morning toilet which will be shortened to make up for lost time.

The unconscious manner and even slipshod method employed by the majority of patients in cleaning their teeth are responsible for the unsanitary and diseased condition of the mouth so often encountered. We should tell our patients that they must consult a mirror after or even while brushing their teeth in order to be certain that they have removed all the white deposits or plaques from even the most inaccessible areas. When they manicure their nails, they do not gaze up into the sky but concentrate their attention upon what they are doing, and their teeth are surely worthy of a similar effort.

The value of dental cosmetics in the form of tooth-pastes, powders or mouth washes is greatly exaggerated in the minds of the public. Many believe implicitly in the advertisements of the manufacturers and are often surprised that these remedies do not fulfil their promises. They frequently regard the toothbrush merely as an instrument to spread the tooth-paste or powder upon their teeth, forgetting that the principal function of the toothbrush is to remove the bacterial plaques and food debris.

It is perfectly natural for the patient to believe that when the gum bleeds he has injured it, and therefore he exercises greater care in the use of the toothbrush. He procures softer and softer brushes, some patients even going to the extreme of believing it to be

impossible to use a toothbrush and attempting to clean the teeth with a handkerchief or cotton. This leads to extremely unsanitary and pathological conditions. Therefore, impress the fact upon the patients that those areas in which the tissues are inflamed and bleed readily need more, not less, brushing; that they need more massage, and that only in this way can they hope to retain their mouths in a physiologically clean condition.

Charles F. Bodecker, D.D.S., F.A.C.D., *The Dental Digest* (Sept.), 1928.

Factors in the Decay of Teeth—

In the annual inspection of the school children of Rochester, a high incidence of dental caries was found. This corresponds roughly to observations elsewhere in the northern states. In order to evaluate the possible etiologic factors, two groups of children were selected for comparison: 25 with perfect or nearly perfect teeth and 25 with marked dental caries. It seemed probable that the differences would be most striking if extremes were chosen.

The difference in the data obtained in the two groups is not so striking as one would expect. The only feature that seems to be of definite etiologic significance in preventing decay of teeth is a diet composed largely of fruits and vegetables. Heredity, infectious diseases and care of the teeth appear to be of little, if any, significance.

Louise O. Kappes, M.D., *Am. J. Dis. Child.*, Aug., 1928.

School Strain and the Underweight Child—In the school studied during November, 1927, 67 per cent of the pupils were underweight. This condition was assumed to be due to strain induced by school work and the problem was approached on that basis.

The community served by the school was composed of agricultural and industrial classes. The children were transported to school in busses and were obliged to remain in school until 3.10 P.M.

As a demonstration two groups of 8 children each were formed—the test group and the control group. The control group continued their school work in the usual manner, save that they were weighed and measured weekly.

Tuberculosis among Young Women—Analysis of tuberculosis mortality during the last decade by age periods shows the following:

DECLINE IN TUBERCULOSIS MORTALITY

Age	Per Cent
5 years	over 50
5-14	41
15-25	18
25-44	42
65 and over	31
In general	36

The one age group from 15-25 has made the least progress. Considering this group, we find great disparity between the male and female, the death rate for girls of ages 15-19 being 75 per cent higher than for boys, and in the age group of 20-24 the death rate for women being 20-25 per cent higher than for men.

The Metropolitan Life Insurance Company's experience has shown this same lack of decrease since 1915. They say: "Contemporaneous with a declining death rate, something has occurred within the past 15 years to cause the mortality among the young white women to be higher than that of young white men." This experience has not been true in England and Wales, where the greatest reduction has been among young women of the age group 15-25 years.

The article continues:

What is the answer? Nobody knows. Various causes are adduced by many writers. The increased industrialization of women which took place during the war years, the extra curriculum activities of high school and college students, a different and more virulent type of disease at the younger ages, jazz parties, late hours, the scanty clothing of present-day young women, the physiological changes following the adolescent period, the dieting fad—all these in varying degree may have their part in the result.

Whatever the cause, or causes, the situation is with us and is perhaps the most important phase of the tuberculosis problem in the United States today.

The nursing profession is one that must assist in coping with this situation, since they

recruit their ranks from young women at these very ages. They must recognize, therefore, that they are dealing with a segregated group which have the highest mortality from tuberculosis in the entire population, and should make provision for reducing that menace to a minimum.

The few studies made on the incidence of tuberculosis among nurses in training show that the rate is much higher among them than among young women of the same ages in the general population. Of the nurses receiving aid from the Relief Fund of the American Nurses Association, 54 per cent have tuberculosis, these cases falling largely among the younger women from 21-30 years of age.

The remedy suggested is:

First, the recognition on the part of everybody connected with nurses' training that tuberculosis among them is a very real and ever present problem. Second, a very careful physical examination of all applicants for training, with X-ray or fluoroscope readings and a tuberculin test; repeated thorough examinations at regular intervals, preferably every six months. Third, a regulation of the hours of work so that each trainee should have sufficient time for recreation and rest. Fourth, provision of recreation facilities and opportunities for physical exercise. Fifth, teaching of the fundamental facts about tuberculosis, its prevention and treatment, to trainees, and the encouragement of a desire on their part for positive health.

Everyone interested in training schools for nurses would do well to read and ponder on Miss Whitney's article.—*Jessamine S. Whitney, Tuberculosis among Young Women with Special Reference to Tuberculosis among Nurses, Am. J. Nurs., 28, 8: 766 (Aug.), 1928.*
K. F.

Iceland and Its Nursing Service—The real organization of public health work in Iceland may be traced to the efforts of Bjarni Pálsson, the first recognized medical man in Iceland. He studied in Denmark and was appointed by the government in 1760 as their representative for medical affairs. One of his chief duties was to teach the public

elementary hygiene. He also trained young men to help him in his medical work and instructed, supervised, and advised the women who practiced midwifery.

The fight against leprosy is responsible for the beginning of nursing work in Iceland. In 1897, the Danish Free Masons built a hospital for lepers in Iceland. One condition in the gift of deed was that the hospital should employ a Danish trained nurse. The act meant the dawning of nursing in Iceland. As time went on, an increasing number of young women went to Denmark for their training. But for a long time, the word "nurse" meant to the Icelander the Danish trained nurse at the leper hospital.

The increasing communication facilities slowly woke Iceland to its health needs. Now there are 47 district medical officers holding their appointments under the Chief Medical Officer at Reykjavik, the capital. A mental hospital, two tuberculosis sanatoria, and several general hospitals have been built. A state hospital is now being constructed, which will be connected with schools for the medical, nursing, and midwifery professions in Iceland.

There are two Visiting Nurse Associations at the capital, which provide nurses for visiting and hourly nursing and for private duty.

In the year 1920, the Icelandic Nursing Association was formed, made up of Icelandic nurses and some Danish colleagues living in Iceland. There were 12 members. At the present time the organization has 37 active members and 23 associate members, the latter group being made up of student nurses.—From an abstract of Iceland and Its Nursing Service, *Pub. Health Nurse*, 20, 9: 479 (Sept.), 1928.

EDITOR'S NOTE: We can picture better the problems confronting a health worker in Iceland when we recall that it is a mountainous island of some 39,700

square miles, of which only about 2,800 square miles are meadowland. The interior of the island is made up of uninhabitable volcanoes, lava fields, and glaciers. The population of about 91,900 is widely scattered through the mountains for the most part. The mean temperature in February is 27° and in July 54°.

Indian Nursing Service—The 350,000 American Indians existing in this country constitute a Federal Group which offers many difficult health problems not controllable by state health services.

Aside from the ordinary problems of nutrition, housing, quarantine, and isolation, are those of dealing with extreme sparsity of population, differences in type of country, and the varied superstitions of each tribe.

Recently the Indian Bureau has been discouraging the nomadic habits of the Indians by granting individual property rights, encouraging the building of permanent dwellings and supplying field workers to instruct these people in sanitation and hygienic living.

In the last few years adult education has been carried on through encouraging better management of agricultural opportunities, farming and stock-raising with the men, cooking and food preserving with women. Children have been organized into clubs to compete in the same sort of projects.

The field work of the Indian Nursing Service has been organized only since 1924, and has rightly been termed a pioneer service, since it deals with a new service among primitive superstitious people in a sparsely settled country, having only poor roads. At present most of the maternity and infant work is being done with the adult population, but the problem is also being approached in schools along with the other forms of health teaching.

The main disease problems of tra-

choma and tuberculosis are being handled by traveling specialists, and by hospitals located on each reservation. Sanatorium treatment is given for early cases of tuberculosis, and before long diagnostic clinics will be established for the detection of cases in the very early stages of the disease.

In rendering this service, the federal government is not only aiding the Indian to approach the status of his white neighbor, but it is also contributing toward the solution of state problems of rural health.—Elinor Gregg, Nursing Service to the North American Indian, *International Council of Nurses*, 3, 2: 137 (Apr.), 1928. C. F. E.

Strength in Unity—Public health nursing services in Ohio have proved again the value of unity for increased efficiency of service.

Of the 828 public health nurses employed in this state, 138 find their work in the rural districts, 69 of the 88 counties having county nursing service. To prevent duplication of service and to decrease the amount of time spent in travel, every effort is made by private agencies to strengthen official health machinery. While many of these nurses are employed by county boards of health, it is not an uncommon event to have a nurse employed jointly by the county board of health, the board of education, the county commissioner, and a private agency.

Of the 690 public health nurses serving the urban population, 251 are financed by 38 city boards of health; 78 by boards of health and private agencies jointly; 116 by 47 boards of education; and 245 by 63 private agencies.

Light instead of Darkness—Most of us have experienced the darkness which used to be imposed upon those

children who had that popular disease of childhood, the measles. Now, modern teaching is coming to the rescue of the future victims of the disease. Fresh air and good light are necessary in measles. If these are absent, a favorable condition for the growth of undesirable germs is created, for many germs grow best in darkness or semi-darkness.

However, the eyes deserve consideration. Little pledgets of cotton, dipped in cool water, placed for a few minutes on the inflamed eyes in the early stages of the disease, are comforting. If pus is present, very careful cleansing is advised. The eyes may be protected further by turning the head of the bed toward the window. If the light is still too intense, a simple eye shade worn on the forehead may be used to soften it.

Measles is not a cause of crossed eyes. If, during or after any illness, the eyes are used incorrectly (at too close range and for long periods of time) while the muscles are soft, they may become crossed.—B. Franklin Royer, M.D., *Don't Keep Them in the Dark, Hygeia*, 6, 7: 497-499 (Sept.), 1928.

Calendar for 1929—The National League of Nursing Education has just published the 1929 calendar which contains reproductions of historic hospitals of Europe. A picture of the St. Jean Hospital in Bruges appears on the cover of the calendar, reproduced in beautiful soft colorings. With each picture is a brief historical description. A picturesque map is included.

Orders may be sent to headquarters—370 Seventh Avenue, New York, N. Y. The calendar is sold for the benefit of the work of the League and is widely used as a Christmas gift. It costs \$1.00, or if ordered in lots of 50 or more—75 cents apiece.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

CONVENTIONS

"Publicity Clinic—A School for Advertising," was a feature of the Mississippi Valley Conference of Tuberculosis. "Samples of material and actual speeches were dissected by the audience." Conducted by two university professors.

At the same meeting Marguerite Breen, Minnesota Public Health Assn., presented "Viewing Our Publicity Work with an Analytical Eye."

Topics and suggestions for convention programs will be supplied by the Public Health Education Section. The section is ready to plan or to conduct education-publicity institutes, where adequate interest is assured.

As a matter of record it is good to note the following array of topics on health education and publicity at the Chicago meeting of the A. P. H. A.: How to Use Effectively Civic Groups in Promoting Health Programs (General Session); A County Wide Screening Campaign (Public Health Engineering); How Employee Magazines Can Be Used to Promote Health (Industrial Hygiene); Health Education in an Industrial Plant (Industrial Hygiene); What We Should Strive for in Food Advertising (Food, Drugs and Nutrition); Dental Hygiene session (Child Hygiene), and Health Education Division, American Child Health Association, devoted to classroom education; Sex Education, One-day Institute conducted by Illinois Social Hygiene Association; and the various sessions of Public Health Education Section. Moral: "I will

make a special effort to attend the 1929 convention, and I will try to interest at least one other health worker to do likewise."

SLIDES AND FILM SLIDES

"One of the latest devices for visualizing health is the film strip or film slide. This is a series of pictures printed together on a strip of film instead of on individual glass slides. There are several projectors on the market for showing film strips. They can also be used in an ordinary stereopticon machine with a special attachment."

The Metropolitan Life Insurance Company now has available for free distribution the following film strips:

"How to Live Long," "No More Diphtheria," "One Scar or Many?" "Pasteur" (especially for junior and senior high schools), and "Working for Dear Life."

A new "still" film showing the various affections of the heart has just been made available through the generosity of Dr. Emanuel Libman to the American Heart Association. It represents a collection of pathologic specimens secured over a period of about twenty years by Dr. Libman and his associate, Dr. Benjamin Sacks. The captions are sufficiently explanatory and the film should appeal to physicians interested in the pathology of the various types of heart disease. It is not for popular education, but for medical societies primarily.

THE POST OFFICE

Careful study of the new postal regulations may reveal opportunities for saving money—or new helps in making

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

use of the mails. Because of the many new practices and the possibilities of varying local interpretations, always consult the local post office before making use of the new regulations. And send your questions to the editor.

MOTION PICTURES

Health Films and Minute Movies, Metropolitan Life Insurance Co., New York, N. Y., or Ottawa, Can. Descriptive catalog of motion pictures and film strips.

Overweight is no laughing matter; it is a serious health menace. This, in a sentence, is the theme of the new moving picture "Too Many Pounds," released by the Metropolitan Life Insurance Company. The picture shows how present-day lack of exercise, and the ease of living made possible by machinery, have helped to create a very general problem of overweight. This fact is made vivid by a series of contrasting pictures showing the difference between pioneer days and the present. Having stated the problem, the picture shows what one can do about "too many pounds" through exercise and diet under the doctor's direction.

A folder, "What Do the Scales Tell You?" is a collection of weight-for-height tables. This is suitable for distribution at a showing of "Too Many Pounds." To those individuals who are particularly interested in the subject, the Metropolitan Life Insurance Co. can supply their regular pamphlet on "Overweight." Picture free of charge except for transportation expenses.

"See a Movie and Live Longer," by Kathleen Crowley. *Survey*, 112 East 19th St., New York, N. Y., June 15, 1928. 25 cents. The Waterbury Girls' Club gives health movies to the community.

A new one-reel film entitled "The Best-Fed Baby" has been issued by the Children's Bureau, U. S. Department of Labor, Washington, D. C. Its purpose is to advise mothers against the practice of early weaning. The story is about two children, Jack and Jill, and

their young mothers. It shows that a mother's ability to nurse her baby is a matter that lies largely in her own hands, and that much unnecessary weaning can be prevented by simple and natural care.

"Beware the Pitfalls"—an 8-minute animated cartoon statistical picture directed by Iago Galdston, M.D. Detailed synopsis in reprint from *Long Island Medical Journal*. Free of New York Tuberculosis and Health Assn., 244 Madison Ave., New York, N. Y.

EXHIBITS

Why not a window or empty store-room display of fresh air devices? Consult architects, hardware dealers and others to locate practicable devices for windows. Search for home-made expedients. This seems to provide an opening to enlist a committee of architects and others. After this exhibit has opened the subject the committee may be interested in going further into it in preparing for a more elaborate display in the future.

"Window Dressing for Health," by Mary L. Gardner. *Survey*, 112 East 19th St., New York, N. Y., June 15, 1928. 25 cents. The Eastchester Neighborhood Assn. does store window propaganda.

"Will you please send me information concerning exhibits, especially any publications you may have."—From a state college of agriculture specialist in nutrition. What kind of exhibits for what purpose at what time and where and at what cost—what *would* you try to tell this specialist?

EDUCATIONAL MATERIAL

Cancer. 16 p. pamphlet. John Hancock Mutual Life Ins. Co., Boston, Mass. Prepared in coöperation with American Society for Control of Cancer. Free.

Malaria. 8 p. pamphlet with illus.

Metropolitan Life Ins. Co., New York, N. Y. *Free*.

A series of pamphlets on "the teeth and their care prepared for the information of the public." Educational Dept., American Dental Assn., 58 East Washington St., Chicago, Ill.

A group of posters and posterettes (stickers) "intended for use in classrooms, the posterettes serving as a supplementary educational instrument to be used in routine classroom work, such as composition, free-hand drawing, home economics, and hygiene." By New York Tuberculosis and Health Assn. Distributed by National Tuberculosis Assn. Open windows, clean mouth and body, milk and vegetables, etc. White silhouettes on red. Well done.

CONTESTS

After one has struggled with wording a diphtheria poster to make it scientifically accurate, popular and action-compelling—what can he say about turning loose a lot of high school art students to concoct phrases on posters that will satisfy the public health specialists? One way out is to submit as a part of the contest material a selection of phrases stating the scientific facts. (More contest suggestions to follow this.)

A contest to emphasize the various ways of putting milk in the diet is being promoted by the Evaporated Milk Assn., 231 South La Salle St., Chicago, Ill. Particulars upon request. The University of Chicago, Good House-keeping Institute, and the American Child Health Assn. are represented on the jury which will award the \$10,000 in prizes.

"Posterizing Diphtheria Prevention," in *The Poster*, Chicago, Ill. (Aug., 1928). An illustrated account of the New York poster contest.

A "State Diphtheria Poster Contest Number," *S. C. A. A. News* (105 East 22d St., New York, N. Y.), reproduces

20 of the posters in black and white. *Free*. 1,000 copies for \$9.00.

A book store, according to *Publishers' Weekly*, aroused much interest through offering a prize for the oldest and most valuable book owned in the community. Try a contest for the oldest "health book" or pamphlet. Phrase the offer to bring out the "home doctor books." When the award is announced give out the report of a committee on the general good and bad features of the entries. Display a selection of the old books in contrast with some new and accepted books and pamphlets in a book store window.

In the prize playwriting contests for high school students, Atlanta, Ga., won first and third place, the second prize going to Fall River, Mass. Details in *Bulletin*, National Tuberculosis Assn., 370 Seventh Ave., New York, N. Y., Aug., 1928.

Nearly 7,000 spectators at city-wide first aid competition in Chicago. See *Red Cross Courier*, Washington, July 2, 1928.

Three prize stories in the contest conducted by the *Public Health Nurse* were published in the March, April and May issues of that magazine.

For results of the state diphtheria poster contest see *S. C. A. A. News*, 105 East 22d St., New York, N. Y., July, 1928. *Free*.

HONORABLE MENTION

To East Harlem Nursing and Health Demonstration (354 East 116th St., New York, N. Y.): For the Maternity Service Report—with table of contents and easy to find facts (date, price, cover page, one-sentence summary of scope of the report).

To American Public Health Assn.: For an *Appraisal of Public Health Activities in Cincinnati, Ohio*—with a title page including well-arranged material desirable in a survey report, and a detailed table of contents.

SLOGANS AND PHRASES

"According to all the signs, September is a good month in which to be careful."—*The Anode*, Butte, Mont.

"Better Children for our Nation—A Better Nation for our Children"—Cover page of *The Story of May Day*.

"Syracuse Wishes You Well"—*Better Health*, Syracuse, N. Y.

"Too Many and Too Young"—*Racine Weekly Health Review*. Too many early deaths.

"It is not the Babies Born, but the Babies Saved that count."—Ill. State Tuberculosis Assn.

"Accidents do not happen—they are caused."—*The Foreman*, Wausau, Wis.

REQUESTS

Who publishes a small 4-page folder entitled Sun Baths (for small children)? And why, please, is no publisher given?

A Texas county public health committee wanted "suggestions on how to make posters." They were referred to The Amateur Poster Maker (Pilgrim Press, Boston, Mass. \$1.00) and to Posters and Poster Making (Student Volunteer Movement, 25 Madison Ave., New York, N. Y. 25 cents). Any other suggestions?

Wanted: Photographs showing scales being used by staff or citizens.

Wanted: Photographs of many types of health service—by several book publishers. A chance to serve and gain fame. What have you? Have they been used anywhere?

BULLETINS

An attractively illustrated envelope is used for the *Health Bulletin* of the Health Conservation Assn., Hall Bldg., Kansas City, Mo. Sample free.

If you mail marked copies of your bulletin or house organ to persons and agencies mentioned in it in any fashion

you may strengthen friendships. Even those who are on the mailing list may overlook the item if not marked—and some of your readers will appreciate having an extra copy.

For a list of humorous cuts for multi-graphed or printed bulletins write "171" on your business card, or on a 3 x 5 card, with your full address—and send to the editor.

Bulletin, St. Louis Health Dept., May, 1928, is a social hygiene number, prepared by the Missouri Social Hygiene Assn. It contains some interesting copy, and is a good example of co-operation between official and unofficial agencies.

"Some Human Interest Stories" is a new heading in *Monthly Bulletin*, Indiana State Board of Health. Visiting nurses are contributing the stories.

REGRETTABLE—BUT TRUE

The annual report of a state tuberculosis association: Rather good cover page; then a blank page; then comes "Report of Executive Office." Why should anyone except the executive secretary and some of the board members care to read a "report of the executive office"? Much the same material would stand a better chance of getting a reading if that report could be labelled to suggest a real common interest.

Thanks for "Attention Calling"—Many of the best bits for this department are not reported by the health department or health association responsible for them—but happily several of our readers recognize the common right to the good idea wherever it may sprout. Two of the most consistent "attention callers" are Ray H. Everett and James A. Tobey. We thank you! And hope for more of your kind.

LAW AND LEGISLATION

JAMES A. TOBEY, LL. B., DR. P. H.

The Next Step in Public Health—Sanitarians have long been agreed that one of the necessary next steps in public health progress is the more effective co-ordination of federal health activities. Louis I. Harris, M.D., as chairman of the Section on Preventive and Industrial Medicine and Public Health of the American Medical Association, discussed the matter in an able manner last June in his chairman's address, which has been printed in the *Journal of the American Medical Association* for August 25, 1928.

"Federal legislation is needed to establish an independent federal department to guide and coördinate public health activities, be they of an administrative or of a research character," writes Dr. Harris, and he properly points that "This is long overdue." He suggests that, without invading state rights, such a federal department might establish standards in public health, analogous to the service of the U. S. Bureau of Standards. Among standards which he mentions as possible are those pertaining to budgets for official health work, qualifications for those who practice public health, and tenure of office. He says:

When economy seems to be so large a claim to distinction of the arbiters of our national affairs, it is amazing that the bureaus, divisions and laboratories having health functions dispersed among the various departments of the federal government have not been united for the sake of economy of money and effort and of the strength that makes for unity.

It is, indeed, amazing.

A much less definite scheme is advocated by Dr. C. L. Ferguson writing on "Health in Industry" in the *Journal of the A. M. A.* for September 22, 1928.

He writes: "To have a health program function for the public as it does for the workers in a well organized industry would require national, state and local organizations." The author is evidently oblivious of the fact that these already exist. "The President of the United States would be responsible for the national health," he continues; "this responsibility would be delegated down through the states to the various physicians in each community or county."

When the 71st Congress convenes in December, it is to be hoped that practical legislation for federal health correlation will be considered, as it was in the 70th Congress, and that if passed, as it also was, there will be a broad-minded President who will approve the measure, and not veto it, as unfortunately happened.

School Medical Inspection Laws—

Forty-two states now have school medical inspection laws of some kind, according to the September, 1928, number of *School Life* of the U. S. Bureau of Education, in the Division of School Hygiene of which James F. Rogers, M.D., is director. In 16 states medical examination is mandatory for pupils in all school districts. Examinations are given in 23 states by specially trained persons—physicians or nurses, physical directors, dentists, or some combination of these. In 13 states examinations may be given by the teacher; in 2 states by the superintendent, principal or teacher.

Going Too Far—A milk ordinance of the City of Bartow, Fla., which imposed a charge of \$25 a day for an in-

spection of dairies more than five miles beyond the city limits, and no such extortion against dairies nearer the city, has very properly been held unreasonable and void by the Supreme Court of Florida, *Root v. Mizel*, 117 So. 380.

Tuberculin Test Upheld—In at least a dozen states the courts of last resort have sustained laws requiring the tuberculin testing of cattle. These decisions have been handed down in Iowa, Kentucky, Louisiana, Maryland, Minnesota, Mississippi, Missouri, Nebraska, New Jersey, New York, Tennessee and Wisconsin. In a recent and able opinion, the Court of Appeals of New York has affirmed a decision of the Appellate Division of the New York Supreme Court upholding the tuberculin testing law of that state. *People v. Teuscher*, 248 N. Y. 454.

In New York the Agriculture and Markets Law states, among other things, that whenever 90 per cent of the cattle in any town have been subjected to the tuberculin test and the owner of any untested herd refuses or neglects to have his herd tested, the Commissioner of Farms and Markets may order his farm quarantined, so that no animal and no product may be removed from it. Such an order was issued against Teuscher, a farmer of Rome Township. He refused to obey and assailed the statute as an unconstitutional interference with liberty and property and a denial of the equal protection of the laws.

The court held, however, that the statute was valid and that the area plan violated no constitutional requirements. "Legislation is not void because it hits the evil that is uppermost," said the court. "Equally it is not void because it hits the evil that is nearest." It was also pointed out that similar legislation exists in Iowa, Minnesota, New Jersey, Vermont, Massachusetts, California, Illinois, Idaho, Indiana, Missouri, Wisconsin, Ohio, Tennessee, and Washington,

and that "an evil prevalent far and wide has evoked far and wide the reaction of a like response."

The command of the executive charged with enforcing this New York law was held to be neither a denial of equal laws nor an illegitimate delegation of legislative power. A notable statement in the opinion is the following:

Small use would there be in stimulating the many within a township to a care of the public health, if one or a few wisecracks or obstructionists could make the labor vain. More and more, in its social engineering, the law is looking to coöperative effort by those within an industry as a force for social good. . . . We see this in the very statutes, already quoted, with their attempt to check tuberculosis by coöperative effort.

Septic Tank as a Nuisance—A person can maintain a suit against a city for having a septic tank in operation near her residence, but to recover damages it must be alleged and proved that the plaintiff suffered special injuries different from those suffered by the public generally, according to a recent Missouri decision, *Newman v. City of Marceline*, 6 S. W. (2d) 659.

In Texas the erection of a slaughterhouse was enjoined on the ground that a nuisance would be created. *Huff v. Letsinger et al.*, 7 S. W. (2d) 181.

Physical Examinations for Occupational Diseases—In 5 states laws require monthly physical examinations of certain industrial employes, according to an item in the *Monthly Labor Review* of the U. S. Department of Labor for September, 1928. The Ohio, Pennsylvania, and New Jersey acts are said to be aimed chiefly at the lead hazard, while the Illinois and Missouri laws "cover a great number of diseases."

In 15 states there are laws which make it the duty of retained physicians having knowledge of persons believed to be suffering from certain occupational diseases contracted in employment to report them to departments of health or

labor. The states having such laws are said to be: Connecticut, Illinois, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island and Wisconsin.

The Quinine Monopoly—Of importance to public health and medical science is the announcement of the U. S. Department of Justice, dated September 20, that a consent decree had been entered by the Federal District Court in New York, permanently enjoining further violations of the anti-trust laws by foreign interests who control the world's supply of quinine. This action followed the seizure by the government of about \$100,000 worth of quinine in warehouses in New York.

Ninety per cent of the world's quinine originates in Java in the Dutch East Indies, and a syndicate of Dutch, German, French, English, and American manufacturers has absolutely controlled production, distribution and prices. This monopoly has been "about as effective as there is anywhere," according to the U. S. Department of Commerce, which has coöperated in teaching this syndicate a lesson.

By the terms of the decree all manufacturers of quinine will henceforth be restrained from:

1. Imposing restrictions on the resale of quinine in the United States.
2. Hindering the shipment in, into, or from the United States of cinchona bark or quinine derivatives.
3. Participating in any arrangement for pool-

ing or division of profits or territory with reference to sales made within the United States.

4. Discriminating between purchasers located within the United States.

5. Selling on the condition that the purchaser will not deal with a competitor of the seller.

Miscellaneous Items—The Indiana decision requiring a city to pay damages for stream pollution, *City of Frankfort v. Slipper*, which was discussed in the September JOURNAL, may be found in Volume 162, *Northeastern Reporter*, page 241.

A bulletin on Mosquito Remedies and Preventives (*Farmers Bulletin No. 1570*) has been issued by the U. S. Department of Agriculture. On September 20, 1928, the Bureau of Entomology of this department gave out a statement that Paris green is valuable to dust pools of water where mosquitoes breed and thus prevent the breeding. It works especially well in the case of the anopheles, say Drs. L. O. Howard and F. C. Bishopp of the bureau.

Reindeer meat is extolled in a statement from the U. S. Department of the Interior, issued on September 21, 1928. This meat is said to be highly nutritious.

Still another department of the federal government has recently given out information of a health character. The Bureau of Standards tells us that batiste or nainsook cotton, linen, and certain kinds of rayon are more transparent to ultra-violet rays than are pure silk or wool. This may have a practical application in the clothing of children.

because of limitations of space and of pertinacy, and of relative completeness of the available information, the subject matter is restricted to mammalian cells, historical discussions are largely excluded, and the developmental and embryological phases minimized.

Although the title expressly states that the scope of the work is the cell "in health and disease," there is a disappointingly small amount of information on the pathological phases of the various cellular types treated in the 37 chapters of the work.

The editor and his collaborators are to be congratulated on the uniformly high order of excellence, the well balanced proportions in the treatment of the various parts, and the scholarly thoroughness which combine to give a unity to the ensemble. The illustrations are less well coördinated.

Cowdry's *Special Cytology* is a companion work to the *General Cytology*, prepared by a comparable group of collaborators. This later work will appeal to a larger group of persons, especially to students of medicine. It is indispensable to every student of histology and all students and investigators in most fields of biology will find it invaluable as an authoritative work of reference. CHARLES A. KOFOID

Dictionary of American Medical Biography—By Howard A. Kelly, M.D., LL.D., and Walter L. Burrage, M.D. New York: Appleton, 1928. 1,364 pp. Price, \$12.00.

This is essentially the second edition of *American Medical Biographies*, and will be welcomed by all interested in history as well as in medicine. There are 2,049 biographies given, some 300 of which are new, certain others having been removed, leaving a total of 101 sketches over the previous volume. The men selected for notice are apparently wisely chosen, and on the whole the book is remarkably accurate,

though certain errors have crept in which should have been corrected.

The writer believes that the present generation pays too little attention to those who have brought medicine in the United States to its present high position. Too great honor cannot be paid to the pioneers, who worked under great difficulties and depended upon the training of their senses and observation for facts which are now derived from the laboratory. There are few studies of more importance than the lives of those who have gone before, and contemplation of their attainments will do much to keep the reader in accord with the Apostolic injunction "Not to think more highly of himself than he ought to think."

The authors state that the present volume is the final form of twenty years of labor—"years of delightful occupation." It shows intensive study and much digging into the records of the past. The medical profession particularly owes a debt of gratitude to the authors for their work.

The printing and make-up of the book are excellent. M. P. RAVENEL

Folklore of the Teeth—By Leo Kanner, M.D. New York: Macmillan, 1928. 316 pp. Price, \$4.00.

That modern Hindus look with disgust upon our unsanitary toothbrush, following the undeniably superior practice of daily use of a fresh fibrous twig, is interesting reading just now—in the day of *Mother India*. This is only one item of 300-odd pages of interesting reading, a fascinating jumble of folklore and history relating to all things dental thrown together kaleidoscopically by Dr. Leo Kanner, of the Yankton State Hospital, Yankton, S. D.

Tracing dental custom through the maze of historic and present-day tribal reference leads us surprisingly far back and far afield. Through these sketchy references gleaned from a vast read-

ing, one sees in the superstitious and religious practices of present-day primitive peoples glimpses of similar beginnings scattered along historical chronology.

That "cleanliness is next to godliness" is by no means a modern conception—"You shall clean your mouths, for this is a means of praising God," was the dictum of the Prophet, set down in a compilation of Mohammedan writers in 900 A.D. Before that (in 632 A.D.), Abu the Truthful said, "My father told me (he knew it from Ibn Abi Shaiba, he from Abd Allah b. Idris, he from Muhammed b. Ishaq, he from Abd Allah b. Abi Bekr, he from Omar, he from Aisha, Muhammed's favorite wife) that the Prophet said this: 'The siwak is an implement for the cleansing of teeth and a pleasure to God.'"

We learn that artificial dentures were common in Talmudic times and came by way of the Greeks and Etruscans to Rome at the time of the Emperors, but all as a means of feminine adornment. He quotes from Martial who says of one of the Roman ladies: "Laicania has white teeth, Thais brown. How comes it? One has false teeth, one her own."

It is interesting to read that the tooth pick along with the ear spoon and head scratcher and other toilet articles has been frequently found by archeologists in ancient graves.

Also, care of the removal of food from the teeth after eating is so early and so widespread a custom that its survival would seem to indicate a hygienic value, although the writer's assumption of causal relationship between the dirtiness of the teeth of certain South African and South American tribes and their carious condition leaves out of consideration his own implication of dietary deficiency in the statement that "their food consists principally of flour." Again, the discussion of mastic,

betel and gambir is concluded by the somewhat questionable statement, "all this must prevent the development of caries." While it is clear, in reading the book, that the writer assumes that the reader will read from his own background of information, this is the only caution to be sounded in connection with the use of this delightful book, that it is literature and folklore—not intended by the author to be in any degree a treatise on modern dental science.

The book will be of interest to a great variety of readers—the dentist, to trace the development of modern dentistry; the student of social science who finds in many of the customs described interest more fundamental than dental; and the teacher in high school or college who is hard put to it to find something to give the saving touch of humor to his classroom lecture on a very resistant subject. MAUD A. BROWN

A Short Manual of Industrial Hygiene—By Leonard P. Lockhart.
London: John Murray, 1927. 114 pp. Price, \$1.00.

The chief aim of this small volume, according to its author, is to interest industrial supervisors in the general problems of industrial health, and to show how in these matters the interests of both employers and employes are inextricably interwoven. To one experienced in the field of industrial hygiene the need for such a book as the present one is evident. Factory managers, foremen and supervisors continually ask questions concerning industrial hygiene which are answered by this small volume. In all comprising 7 chapters and of slightly over 100 pages, this volume deals with questions of ventilation, illumination, washing facilities, personal hygiene, common communicable diseases, accidents, fatigue, seating, and a discussion of adolescence and the youthful employe. The reader of this book

must bear in mind the intent of the author. The factory supervisor and official will do well to have copies of this book available for the use of foremen and overseers.

LEONARD GREENBURG

Mouth Hygiene—By *Alfred C. Fones, D.D.S. (3d ed., rev.) Philadelphia: Lea & Febiger, 1927. 348 pp. Price, \$5.00.*

This is a textbook for dental hygienists. It gives in clear and simple language an excellent picture of the anatomy of the various parts of the head, including the circulation and nerve supply. It has a long chapter on malocclusion, and stresses, perhaps unduly, its relation to dental disease. It outlines clearly and in great detail the work and duties of the dental hygienist in the practice of her profession.

In discussing the subjects of deposits and accretions on the teeth, pyorrhea alveolaris and dental caries, great emphasis is placed on the influence of external causes in distinction from physiological causes. It is apparently the unanimous opinion of the authors who contribute to the text that mechanical irritation resulting from deposits on the teeth, the chemistry of the saliva, and lack of mouth cleanliness are the major factors in causing dental decay and infections relating to the teeth. In some respects the book seems to be a defense for that theory; at any rate it gives much more space and lays greater emphasis on the mechanical than on the physiological phases of this problem. One of the authors in speaking of dental caries and pyorrhea states: "The first of these can be reduced appreciably by oral hygiene; the second can be almost entirely prevented by the same method."

Comparatively little is said about the importance of early filling of small cavities and developmental pits and fissures in early child life. One chapter is de-

voted to the subject of foods and another to the history of the dental hygienist movement. The technic of "Prophylactic Treatments" is given in lengthy and minute detail.

The book gives in a very clear manner the views of the authors on the subject of dental hygiene. It fails, however, to give a comprehensive and well balanced picture of the present status of the mouth hygiene movement. The student who studies this text is liable to become prejudiced in his views and practices in the field.

WILLIAM DE KLEINE

Bacteriology for Nurses—By *Charles F. Carter, M.D. St. Louis: Mosby, 1928. 213 pp. Price, \$2.25.*

This book gives a clear exposition of the science of bacteriology and its various applications to medicine. The practical side is emphasized throughout. There are a number of illustrations, most of which are good, but some very poor. Each chapter ends with "Questions for Review."

We know of no more practical book for the use of nurses than this. The printing and make-up are good.

M. P. RAVENEL

Syphilis, A Treatise on Etiology, Pathology, Symptomatology, Diagnosis, Prognosis, Prophylaxis, and Treatment—By *Henry H. Hazen, M.D. (2d ed.) St. Louis: Mosby, 1928. 643 pp. Price, \$10.00.*

The first edition of this book was favorably received. The present work has been entirely revised and partly rewritten. The bibliography has been brought up to date. The illustrations are plentiful and good.

The printing and make-up of the book are excellent, though we wish that a lighter paper had been used. It will doubtless hold its place as a standard text on this most important subject.

M. P. RAVENEL

Diabetic Manual for Patients—*By Henry J. John, M.D., F.A.C.P., Maj. M.R.C. St. Louis: Mosby, 1928. 202 pp. Price, \$2.00.*

This book is written for the guidance of persons suffering from diabetes. It gives simple explanations of the cause of the disease and directions for treatment. The care of medical supervision throughout is emphasized.

Appendices give charts of foods with their relative values in carbohydrates, proteins and fats, and suitable diets and recipes. It is non-technical and can be recommended for the purpose for which it is written.

M. P. RAVENEL

The Opium Problem—*By Charles E. Terry, M.D., and Mildred Pellens, for the Committee on Drug Addictions in collaboration with The Bureau of Social Hygiene, Inc. New York, 1928. 1042 pp. Price, \$5.00.*

Even the alcohol problem has not led to more heated or prolonged controversies than the matter of drug addictions. In 1921, the Committee on Drug Addictions was formed, with Katharine Bement Davis as Chairman, Charles E. Terry, M.D., Executive, and Mildred Pellens, Associate Executive.

The first task was to determine the actual conditions. This involved an enormous amount of work, including correspondence and study of literature. In 1925 the material collected was put into form as a report to the committee, and for the first time there was brought into one volume a compilation of the views of many authorities as well as abstracts of current literature on the subject. The present volume contains the substance of this report, with some condensation. Though the study has been confined to the chronic use of opium and its derivatives, it contains much information about other habit

forming drugs, the laws concerning them, methods of distribution, etc.

The work shows conscientious study, expert compilation and sound judgment, in addition to which its arrangement and wording make it easily available not only to the expert student, but to the social worker or layman who desires information on this most important subject.

There are 9 appendices, 3 of which give the agreements signed at Geneva in 1912 and 1925; others give national and state laws, and the last a digest of editorial literature on the Harrison Act. A well selected bibliography and good index close the volume.

One is tempted to discuss many points, but the *Résumé* by the authors gives an excellent summary which all who have studied the question can accept. There is need of further study and exact experimentation, and until facts can be established, dogmatic statements and half-baked regulatory laws can only lead to injustice, and further confuse a situation which in many respects is far from clear.

It can be said without hesitation that it is the most important contribution to the problem extant, and it can be commended to all classes of readers. The make-up of the book is good.

M. P. RAVENEL

Growing Up—*By Karl de Schweinitz. New York: Macmillan Co., 1928. 104 pp. Price, \$1.75.*

Parents and teachers who are searching for a book that presents the facts of reproduction comprehensible to children between 6 and 12 years of age will find this helpful. The story is told in a simple, straightforward way and the illustrations have been selected with discrimination as well as from the art viewpoint.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

The Question of Vaccination—Excellent editorial comment on the Report of the Committee on Vaccination (Great Britain) which presents positive answers to questions about the relative dangers of vaccinia and mild smallpox, and the possibility of encephalitis following vaccination.

ANON. The Committee on Vaccination. Med. Off., 40: 9 (Sept.), 1928.

Medical Guidance—A valuable presentation of the need of public medical guidance, suggesting the extension of the plan of the Kings County Medical Society. Inquirers are referred to appropriate lists of member general practitioners or specialists.

ARMSTRONG, D. B. Organized Medicine and Individual Health and Medical Guidance. J. A. M. A., 91: 9 (Sept. 1), 1928.

Chromium Plating Hazards—All but 2 of 23 workers in chromium plating plants whose occupational history was known showed some inflammation of the nasal tissue, but no damage to the remainder of the respiratory tract was evident.

BLOOMFIELD, J. J., and BLUM, W. Health Hazards in Chromium Plating. Pub. Health Rep., 43: 36 (Sept. 7), 1928.

Antiseptic Efficiency of Sprays—The record of experiments indicating that antiseptic sprays exert a bactericidal effect upon *B. coli* suspended in air.

DOUGLAS, S. R., *et al.* Effect of Antiseptic Sprays on the Bacterial Content of Air. J. Indust. Hyg., 10: 7 (Sept.), 1928.

Age Distribution of Children's Diseases—Density of population affects the age distribution of children's diseases. The risk of attack is in the

early ages in cities and in the later age groups in rural communities.

FALES, W. T. The Age Distribution of Whooping Cough, Measles, Chickenpox, Scarlet Fever and Diphtheria in Various Areas of the United States. Am. J. Hyg., 8: 5 (Sept.), 1928.

Lessening the Benzol Hazard—A survey indicating a marked decrease in the use of benzol in industry. Substitutes are rapidly being utilized.

HAMILTON, A. The Lessening Menace of Benzol Poisoning in American Industry. J. Indust. Hyg., 10: 7 (Sept.), 1928.

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HARDY, A. V. The Epidemiology of Undulant (Malta) Fever in Iowa. Pub. Health Rep., 43: 38 (Sept. 21), 1928.

Rickets Preventives—Clinical studies are reported which indicate that irradiated ergosterol is the most potent antirachitic agent.

HESS, A. F., and LEWIS, J. M. Clinical Experience with Irradiated Ergosterol. J. A. M. A., 91: 11 (Sept. 15), 1928.

Causes of Tooth Decay—A study of two groups of children with good and bad teeth in which the most significant difference was the diet. Heredity, infectious diseases, and care of the teeth appeared to have little if any effect.

KAPPES, L. O. Factors in the Decay of Teeth. Am. J. Dis. Child., 36: 2 (Aug.), 1928.

The Health Officer's Value—The health officer not only saves the public from contagion, but promotes hygienic habits. His preventive medical activi-

ties do not interfere with curative medicine but tend to make people live to need treatment during a longer life.

KNIGHT, I. W. What is the Value of the Health Officer? *J. M. Soc. New Jersey*, 25: 9 (Sept.), 1928.

Calcium Assimilation—Children fed raw milk maintained a better calcium balance than when on pasteurized, evaporated or dried milk. No noticeable difference was observed in adults.

KRAMER, M. M., *et al.* A Comparison of Raw, Pasteurized, Evaporated, and Dried Milk as Sources of Calcium and Phosphorus for the Human Subject. *J. Biol. Chem.*, 79: 1 (Sept.), 1928.

Typhoid Fever Outbreaks—A detailed account of water-borne typhoid fever outbreaks indicating anew the need for adequate water treatment and the examination of convalescents and food handlers.

KENDALL, C. F. The Epidemiology of Typhoid. *J. A. M. A.*, 91: 11 (Sept. 15), 1928.

Uses of Occupational Therapy—The rehabilitation of the disabled soldier by occupational therapy has been so successful that the same methods should be applied generally to chronically disabled civilian cases.

MOCK, H. E., and ABBEY, M. L. Occupational Therapy. *J. A. M. A.*, 91: 11 (Sept. 15), 1928.

Training Health Officers—The plan of providing practical experience in the field together with a short course of instruction at a University is offered as a practical method of training prospective health officers.

MOUNTIN, J. W. A Plan for Training County Health Officers. *J. A. M. A.*, 91: 10 (Sept. 8), 1928.

Health Supervision—A record of experience in the health supervision of industrial executives, in which the men are found to coöperate, follow hygienic

advice, and correct more than half their defects. The need of exercise in winter is stressed.

MURRAY, H. G. Health Supervision of Executives in Industry. *J. A. M. A.*, 91: 9 (Sept. 1), 1928.

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OXLEY, W. H. F. Prophylaxis in Midwifery. *Med. Off.*, 40: 8 (Aug. 25), 1928.

Etiology of Rickets—Two lectures showing that rickets is a disorder of calcium and phosphorus salt metabolism, usually the result of defective absorption from the bowel, due either to deficiency in the supply of the salts or of Vitamin D.

PARSONS, L. G. Some Recent Advances in Our Knowledge of Rickets and Allied Diseases. *Lancet*, 2: 9-10 (Sept. 1-8), 1928.

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RAMSEY, G. H., *et al.* An Outbreak of Ty-

phoid Fever and Gastroenteritis Attributed to the Consumption of Raw Oysters. Pub. Health Rep., 43: 37 (Sept. 14), 1928.

Skin Disinfectants—A culture of *Staphylococcus aureus* applied to the skin in concentrations fifty times that found on dirty human skin was followed 24 hours later by applications of mercurochrome and iodine. Under these conditions the aqueous-alcohol-acetone solution of mercurochrome was found equal to iodine in disinfection qualities.

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ROOD, E., *et al.* The School Nurse and Health Instruction. Pub. Health Nurse, 20: 9 (Sept.), 1928.

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SIMMONS, J. S. Bactericidal Action of Mer-

curochrome 220 Soluble and Iodine Solutions in Skin Disinfection. J. A. M. A., 91: 10 (Sept. 8), 1928.

Post-War Paratyphoid—A review of several outbreaks of paratyphoid fever indicating that infections contracted during the war may have been responsible for the carriers who began the epidemics.

THOMPSON, H. H. The Post-War Prevalence of Paratyphoid Fever. Pub. Health, 41: 12 (Sept.), 1928.

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THE PROBLEM CHILD AT HOME. A Study in Parent-Child Relationships. By Mary Buell Sayles. New York: Commonwealth Fund Division of Publications, 1928. 342 pp. Price, \$1.50.

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Montclair, N. J.—“The 1927 Health Audit” of the town of Montclair consists of 39 pages of text and statistical data, printed in readable type on soft paper, and bound in attractive green paper covers. Following the Health Department personnel list is a table of contents, facilitating reference to special phases of the report.

The department records the full co-operation of physicians in efforts to educate the public in preventive health measures. Diphtheria prevention has been vigorously advanced, special attention having been given to preschool children. A group of school children (441) inoculated last year were re-Schicked, and of these, 82 per cent were found to have acquired an immunity. Most of those still susceptible were given a second course of inoculations. Of 721 children given the Schick test for the first time, 29 per cent were found to have natural immunity.

Montclair had an estimated population in 1927 of 34,418, of whom 68.5 per cent were native white, 19.5 per cent foreign white and 12 per cent colored. A general death rate of 10.7, a birth rate of 17.9, and an infant mortality rate of 54.5 were recorded. The report concludes with a list of ordinances passed last year, and recommendations for future development.

Newton, Mass.—The concise report of this city of 56,608 population contains a table of deaths classified by age, by cause, and by months, exclusive of stillbirths, for 1927, a table of deaths under 1 year and births, a summary of food inspections, and a table showing the births, deaths, stillbirths and persons married, with population and rates per 1,000 for the years 1918–27. During April, May and June, clinics were

established by the board for the examination of children proposing to enter school in September, for the purpose of discovering and correcting defects before the children entered school. Two hundred and thirty children were examined, of which 27 were found to have defects needing correction, and 15 of these corrections were made before school opened. In the Health Department a nursing division was established. Five school nurses and 1 tuberculosis nurse are working on a 12 months' basis. The city was divided into 6 districts and a nurse put in charge of each district. The table of food inspections shows a total of 181 dairies inspected in 1927. A total of 330 food inspections were made. The death rate for the year was 9.75, the infant mortality rate 48.84, and the birth rate 15.26.

Malden, Mass.—The organization of the Board of Health included 2 health inspectors, 1 part-time milk inspector, 1 public health nurse, 2 baby welfare nurses, and 1 part-time dentist. The death rate for the year was 9.88. Fifty-two deaths from contagious diseases were reported, 18 of which were from tuberculosis. The report of the Malden Tuberculosis Dispensary shows that 1,692 visits, with 77 new examinations and 217 reexaminations, were made. Four hundred and forty-six children were treated at the Dental Clinic, the total clinic attendance being 1,367. Two hundred and six cases were admitted to the Contagious Hospital, 144 of which were scarlet fever, 28 diphtheria and 10 erysipelas. A law to regulate the manufacture of ice cream and one to regulate the operation and equipment of pasteurizing plants were placed on the statutes. Two hundred and twenty dairies were inspected in 1927 as

against 18 for 1926, with 9 less convictions in 1927 than in 1926, indicating the assumption by the dealers of responsibility for the quality of milk.

Attleboro, Mass.—The annual 1927 report of the Health Department of this city of 20,980 people contains two photographs and numerous tables emphasizing particularly the work of the health camp for undernourished boys. The 40 boys in attendance, who were from 10 to 21 per cent underweight, ranged in age from 8 to 14 years. During the 6 weeks the average gain in weight was 7.86 pounds. The camp program featured intensive posture work, while daily classes in health and the various handicrafts were conducted. Three hundred and twenty-seven cases of communicable diseases were reported in Attleboro in 1927 as against 784 in 1926, the lowered incidence being due in part to the small number of chicken pox, measles, German measles and whooping cough cases occurring. Three cases of infantile paralysis were reported with 1 death, as well as a slight increase in the number of scarlet fever and diphtheria cases. There were 267 deaths in Attleboro during the year. The crude death rate was 12.7, the tuberculosis death rate for residents, 20. A table of estimated appropriations for 1928, a complete table of causes of deaths in 1927 by months, and reports of the Health Department nurse and the Inspector of Milk are included.

Knoxville, Tenn.—The annual statement for 1927 of the Bureau of Health of the Department of Public Welfare appears in mimeograph form and contains 103 pages of carefully prepared text and tabular information indicative of commendable progress. Statistical charts indicate steady decreases in deaths from typhoid and other filth-borne diseases coincident with increased privy sanitation. Nursing visits, increased

volume of laboratory work, and progress in milk and meat supervision are also shown graphically. The infant mortality rate of 76 is the lowest in history for this city, the rate for 1926 being 89. A birth rate of 23.5 and a general death rate (corrected for residence) of 13.05 are noted. A per capita expenditure of 61 cents for health is recorded.

Educational work has been extensive and varied. In addition to the distribution of thousands of health bulletins, pamphlets and letters, it has been a part of the work of the bureau's personnel to conduct several classes from high schools and the University of Tennessee, as well as numerous other individuals, through the health center, in an effort to give them a more intimate knowledge of the operation of such an institution. The bureau also assisted the university in training a class of sanitarians for field work in the state.

During the year, 3,330 food handlers from dairies, cafes, cafeterias, grocery stores, etc., were given physical examinations for the detection of communicable diseases. Specimens for laboratory examinations were a routine requirement.

The organizations having their headquarters in the health center building are the Bureau of Health, the Community Chest, the Red Cross, the Girl Scouts, the Junior League, the Anti-tuberculosis Association, the Health and Welfare Association, the Council of Social Agencies, and the Medical Reference Library. In addition, there were operated here the dental, chest and psychiatric clinics.

Grace Hospital, New Haven, Conn.—This recent hospital report for 1927 illustrates certain features of good report making. The flyleaf pictures a child in a wheel chair with her nurse, both of whom appear cheerful. Beneath the photograph is a quotation from Phillips Brooks, "He who ~~helps~~ helps a

child helps humanity with an immediateness which is impossible at any other stage of human life." Well-selected photographs of the institution add interest and appeal. Headings are well placed in relation to subjects, paragraphs and position on the page. Statistical tables are informative and accompanied by descriptive text. The paper has a soft finish and is of good weight.

Winnipeg, Man.—The 1927 Health Department report of 162 pages is one of the best of the year. Following a table of contents, and the organization plan of the department, are pages devoted to the most important statistics, a financial statement, and the health officer's brief review of outstanding features of the year. The remainder of the report is devoted to bureau activities and results.

This city of 198,932 population records a general death rate of 8.29, a birth rate of 22.4, a tuberculosis death rate of 37.2, and an infant mortality rate of 61.17—all lower rates than previously reported for Winnipeg.

There were 48 cases of mild smallpox, with no deaths from this cause. Every case of chicken pox is checked and the diagnosis cleared in order that the possibility of smallpox being unrecognized may be eliminated. The diphtheria situation is analyzed in an interesting manner according to fatality rates in different wards of the city.

The outstanding feature of the diphtheria situation and the reason for the higher rate was a manifestation of increased virulence as compared with past years. A group of cases appeared in the central part of the city in which the infection was probably due to association of the diphtheria organism and the streptococcus. These cases were characterized by the presence of haemorrhagic sloughing membranes, high temperature, great prostration and rapidly fatal termination. In the early stages of these, the diphtheria organism was often not recoverable from throat cultures; later it appeared. Persons who were exposed to these cases developed the same type of disease as the patients. In one instance three people died in one household.

Toxoid administration in the public

and parochial schools and at the Bureau of Child Welfare was carried on throughout the year, as well as in various children's institutions, and there was no trouble from diphtheria in any of them.

The daily per capita consumption of milk and cream amounted to 1.06 pints, 58 per cent of the supply being pasteurized, 40 per cent raw tuberculin tested, and 2 per cent certified. No milk-borne outbreak of disease occurred. As a precautionary measure, all cases of sickness reported or suspected on dairies were investigated, and the majority of such cases were found to be of a non-communicable character.

Pittsburg County, Okla.—The 4th annual report for the year ending June 30, 1928, of the Coöperative Health Unit shows that this county of 52,000 population and area of 1,370 square miles was given 142 lectures on health education with an attendance of 4,600. Four thousand one hundred and fifty-three complete antityphoid administrations and 360 anti-smallpox vaccinations were made. Through one crippled children's clinic and school examinations, 17 major operations were found to be needed and were made under the crippled children's law of the state. The county had 1,078 births and 434 deaths during the year.

Scranton, Pa.—The 42d annual report for this city stresses the development of health education as a function of municipal health service. Eight lectures were given during the year on public health under the auspices of the department. On Child Health Day, 399 babies under 2 years of age were examined. Thirty-one hundred and forty leaflets on "Infant Care" were distributed during the year, as well as an approximate number of leaflets on communicable diseases. The city, with a population of 155,006, had a death rate of 10.7, a birth rate of 21.2 and an infant mortality rate of 13.7.

NEWS FROM THE FIELD

ITALY'S CHILDREN'S BUREAU

DURING 1927, the Children's Bureau of Italy, which administers the child welfare laws of that country, subsidized more than 1,100 child welfare institutions and agencies to the extent of 16,000,000 lire. Of these institutions nearly 700 were colonies at the seashore or in the mountains; these cared for more than 300,000 children.

An important innovation was the introduction of traveling centers for the instruction of mothers in child hygiene. Nine such centers, their staffs aggregating 55 persons, were established in 1927, which gave maternity care to more than 30,000 women.

During 1927 the bureau was instrumental in the enactment of regulations regarding measures dealing with wayward children, employment of women and children, admission of children to motion-picture performances and prohibition of the sale of tobacco and alcohol to young persons.

IMPROVEMENT IN ITALY'S MILK SUPPLY

A NUMBER of the more important cities of Italy, among them Rome, Naples, Milan, and Verona, have established "milk centers," where all milk intended for consumption is sent for sterilization.

Italy's first national conference on milk was held recently in Verona under Government auspices. It was brought out that while the annual consumption of milk per capita is 15 quarts in Italy, it is 90 quarts in England, 235 in Germany, and 265 in Sweden.

DR. LEWIS GRANTED LESLIE DANA MEDAL

THE Leslie Dana Medal was presented to Dr. Park Lewis, vice-president of the National Society for the Prevention of Blindness, on October 18, 1928, at St. Louis, Mo. The medal was presented "for the most outstanding

achievements in the prevention of blindness and the conservation of vision" in America.

This medal is given through the Missouri Association for the Blind, and it is one of the most highly prized marks of recognition in the public health field.

BLIND BABIES

THE State Legislature of New York has granted a budget sufficient to care for 35 blind babies and young children, in the institution maintained by the International Sunshine Society with headquarters at 96 Fifth Avenue, New York, N. Y.

OLEAN, N. Y., TYPHOID OUTBREAK

THE cause of the recent outbreak of typhoid fever in Olean, N. Y., has been traced to a break in the submerged pipe running from one of the South Olean wells to the pumping station, which allowed raw river water to be pumped into the main pipes, the amount of chlorine added being insufficient to protect against this pollution.

NATIONAL SOCIETY FOR THE PREVENTION OF BLINDNESS

A THREE-DAY series of conferences, November 26-28, inclusive, will be held under the auspices of the National Society for the Prevention of Blindness, in the Russell Sage Foundation Building, New York, N. Y. Industrial physicians, ophthalmologists, public health nurses, sight-saving class supervisors and others will participate in the conferences which will be held in connection with the 14th annual meeting of the society.

NEW COURSES AT COLUMBIA UNIVERSITY

THE Department of Health Education at Teachers College, Columbia University, announces two new courses of unusual interest. In the winter ses-

sion, there will be given a course in Methods of Teaching Lip Reading to Deafened Children, in coöperation with the New York League for the Hard of Hearing.

In the spring session, there will be a course on Methods of Teaching in Sight Conservation Classes. This will be given in coöperation with the National Health Council, and the National Society for the Prevention of Blindness. A sight conservation class will be developed as a teaching laboratory for this course.

WORLD'S LARGEST SEWAGE TREATMENT PLANT OPENED

DURING the week of October 8, 1928, the world's largest sewage treatment plant was opened in Chicago, Ill. The North Side Plant, as it is called, covers 97 acres and was built to purify the sewage of an ultimate popu-

lation of 1,340,000. Eight suburbs as well as a large section of the city of Chicago are served.

This plant was built as part of a program to dispose of the city's wastes without injuring neighboring communities.

A NEW FORM OF QUARANTINE CARD

THE following quarantine card used by Dr. H. J. Shelley, health officer of Middletown, N. Y., combines a bit of public health education with its warning.

NOTICE!

There is a case of communicable disease on these premises.

If someone had been careful not to infect others, this case would not have occurred. If *you* are careful—and do not enter while this placard is posted—you will neither contract nor spread the infection. Your co-operation is earnestly requested by

H. J. Shelley, M.D.

PERSONALS

DR. OREN NEWTON, of Taft, Kern County, Calif., has been appointed Health Officer of that county, to succeed Dr. H. M. Hawkins.

DR. WILLIAM SIMPSON, Health Officer of Santa Clara County, Calif., died on September 23, 1928, in San Jose, Calif.

DR. WILLARD W. NYE, Hiawatha, Kan., has resigned as County Health Officer of Brown County.

CARR T. DOWEL, Ph.D., has assumed the duties of dean and director of the college of agriculture and experiment stations at Louisiana State University.

L. L. DICKERSON, Executive Assistant of the board on the library and adult education, American Library Association, Chicago, Ill., has accepted the librarianship of the Indianapolis Public Library, and will assume his new duties some time after October 1.

EDITH GATES is the new head of the health education work of the National Board, Y. W. C. A. Miss Gates has recently been director of health and physical education in Y. W. C. A. centers in eight European countries.

GEORGE A. COOPER of the Monongahela West Penn Public Service Company, Fairmont, W. Va., has been appointed as an Assistant Chief Business Specialist in the Division of Simplified Practice of the Bureau of Standards, U. S. Department of Commerce.

DR. RUSSELL B. HOWARD has taken up the duties of full-time Health Officer of Bulitt County, Ky., with headquarters at Shepherdsville.

DR. EDWIN W. BATHURST has been appointed Health Officer of Edna, Calif.

DR. JAMES E. RUSH has resigned his position as head of the department and professor of hygiene and public

health at the University of Kentucky, Lexington, Ky.

DR. OSCAR M. CRAVEN has resigned as Health Officer of Springfield, O.

DR. ELLIS F. SWARTHOUT has been appointed city physician of Kenosha, Wis., to succeed Dr. O. W. McClusky, who resigned.

EDITH HODGSON, R.N., Santa Fe, N. M., has been appointed Chief of the Divisions of Child Hygiene and Public Health Nursing, to take the place of Dorothy Anderson, R.N.

DR. P. M. STEED has been appointed Health Officer of Luna County, N. M., to fill the place of Dr. J. G. Moir, who resigned recently.

EDNA C. SCHIERENBERG, R.N., has taken the position of Public Health Nurse of Dona Ana County, N. M.

DR. OLIVER L. AUSTIN of Tuckahoe, N. Y., has returned to Eastchester, N. Y., to resume his duties as Health Officer there. Dr. Austin was on an exploration trip to Labrador.

COLONEL ALBERT PFEIFFER, director of the N. Y. State division of Social Hygiene, has been assigned by the War Department to the 362d Medical Regiment as the commanding officer.

DR. EDWIN F. HOYT, Health Officer of Clinton, N. Y., died on October 4. Dr. Hoyt was 83 years old.

MARY A. BROWNELL, formerly assistant to the director of the National Organization for Public Health Nursing, has resigned to become associate director of Judson Health Center, New York, N. Y.

ELIZABETH C. BURGESS of New York, N. Y., has been elected president of the National League of Nursing Education.

CONFERENCES

November 7-10, Texas Association of Sanitarrians, San Antonio, Tex.

November 8, Minnesota Public Health Association, Minneapolis, Minn.

November 8, National Committee for Mental Hygiene, New York, N. Y.

November 11-13, Kentucky Conference of Social Work, Lexington, Ky.

November 13-15, New York State Conference on Social Work, Rochester, N. Y.

November 23, New York State Association of Public Health Laboratories, Albany, N. Y.

November 26-28, National Society for the Prevention of Blindness, New York, N. Y.

November 26-28, West Virginia Public Health Council, Morgantown, W. Va.

December 13-15, American Vocational Association, Philadelphia, Pa.

December 26-29, American Association for Labor Legislation, Chicago, Ill.

December 27-29, Society of American Bacteriologists, Richmond, Va.

December 27-January 2, American Association for the Advancement of Science, New York, N. Y.

December 28, International Congress of Tropical Medicine and Hygiene, Cairo, Egypt.

December 29, American Student Health Association, New Orleans, La.

The Hooper Foundation for Medical Research at the University of California is anxious to obtain recently isolated cultures of *B. proteus*, especially those from foods or those involved in outbreaks of food poisoning.—Address J. C. Geiger, Associate Professor of Epidemiology, University of California, San Francisco, Calif.

American Journal of Public Health

and THE NATION'S HEALTH Vol. X No. 12

Volume XVIII

December, 1928

Number 12

Selling Health—a Vital Duty*

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Health Editor, Chicago Daily News, Chicago, Ill.

IF there is one word more than any other being broadcast in these times, it is the word "Health." More and more the American people are being awakened to a profound realization of the importance that attaches to that word. And not much longer will it be said with truth that greater attention is given to the care of a hog than to that of a human being.

The last decade has witnessed many important advances in America's public health. Each year sees the status of the last eclipsed. But much remains to be done. The thoughts which dominate me are concerned with the important rôle that still remains to those who can and should "sell" health.

Perhaps it may seem to be needless repetition to talk about health publicity. Certainly what I can contribute on this subject is not new, and it may be especially boring to those who are experts on publicity. However, because health publicity has been much discussed, I fear the opinion may be growing that it is a branch of public health science that has matured, and whose functions are established. Unfortunately this young branch of our profession is still in its infancy and its opportunities are still mainly in its future.

Reiteration may dull the glamour of its romance, and may make a bromidic bore of a great tale. We must recognize that years and decades of persistent hammering away at the individual's indifference is necessary, and only by this means will we rouse him to the lessons that should come to him from health propaganda.

How many of you, proponents of health, whose business it is to further the health of the people, sell this commodity called "Health"? Every big business that has something to sell, spends vast sums of

* Presidential Address, delivered before the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 15, 1928.

capital to train and send out live, alert and efficient salesmen. No other business in the world is bigger than that of keeping people well. Why then shall we lack enthusiastic, efficient health salesmen?

If it still needs to be done, we can manufacture two axioms: "Health is a saleable commodity"; and "There is a good market for it all of the time with all of the people." These things are true if health departments and great bodies like the American Public Health Association have the desire and will to create the market and exploit it. You remember that one of the common phrases of the recent war was "carry on." It is up to us who are in the front ranks of health promotion to create the market and then to "carry on" in the cause of this good work.

Mere laws to enforce health do not create health. A desire for good health must first be aroused, stimulated by knowledge of its value and means of attainment. Then the health salesman must come in. Time was when people used to "enjoy" poor health, but that day is going by.

Every health worker should be a health salesman, and to be a good salesman he must know his wares thoroughly. He must have absolute confidence in his line, for to make others believe, he himself must first have the convincing enthusiasm of a great belief.

The health officer who is in the business of selling health must also have sound health himself and must surround himself with evidence of it. If he has small children who are constantly ailing, he cannot argue convincingly for an infant welfare clinic unless he utilizes such or a similar facility himself. If he has a set of neglected teeth, he cannot well convince the community of his belief in the efficacy of a dental clinic.

If the health officer's house or office is insanitary or unscreened, if he and his family sleep with the windows closed, if his personal habits are not the habits of good health, he belies his teachings; gives a bad example; and sets up a most powerful argument against the very things which he is trying to sell. He must not be a health prostitute. Remember that health is more easily caught than taught.

The health officer who urges eating a proper diet, and then does not live by his teachings, cannot expect the community to follow his advice. He must carry his faith into daily personal practice. Who does not know how difficult it is to induce people to use an article unless he himself uses it?

Disease and sickness must be exposed to the cleansing light of universal knowledge. They are largely maintained because of the public's ignorance of what health is and how to keep it.

The efficient health salesman must come in, even more than he has attempted in the past. He must talk health and talk real facts, not surmises. He must be scientific, specific, optimistic; and he must use every available means to reach his audience.

Publicity is the best medium to accomplish these ends. Publicity we have employed, but insufficiently and often by methods that call for radical change.

The first quality of health news must be its accuracy. I preach the lesson that experience has taught me. No publicity should ever be released by the health official unless it has been edited and has met the approval of the technical expert. The context must be right before it is worthy of release.

The value of good health news, published in the right way, is still too often neglected by health authorities. Such news must be the kind that sells health to the community. If it is prepared for reading, it should be prepared in readable print, well spaced, properly headed and paragraphed, thoroughly illustrated, and well printed. Similarly, other forms of publicity should be adequately prepared. An optimistic viewpoint and a cheerful attitude should always be maintained. The sentences should be short and the words simple, so that they may be understood by all who read, including the young and the foreign born.

Simplicity appeals. Need I remind you of the great words that have lived? The whole lesson of prayer was taught by Jesus in a petition of sixty words. The Lord's Prayer is probably more generally known than any other verse. How simple its diction and rhetoric! Were it as complicated as our national anthem not one in a thousand could repeat it. The most wonderful poem in the Bible, the Twenty-third Psalm, consists of 118 simple words. Consider its brevity, its simplicity and its clarity. It is universally known, and probably holds more truth and religion than any other composition of similar length. The world has been slow to learn many of the lessons in the life of Jesus. One of them which is often given little attention, but which is of great importance to preacher, lawyer, orator, hygienist and to a man making a presidential address, is the blessed virtue of being brief.

The greatest speech of all time was given by Lincoln at Gettysburg. Why is it so great? Primarily because of its simplicity and its brevity. Let simple language carry your message to the people.

Few of us can write as the Prophets wrote; and none of us can repeat the feat of Lincoln. *But we can follow*, for the guides they left us are plain and permanent.

Other means we may use; but above all, the press, the greatest molders of public opinion today, the movies, and the radio, must be our media through which we shall build the Empire of Health. Inoculate these media with the seeds of health facts and they will infect the people with messages both gripping and convincing. Health will be even more contagious than sickness is now.

In a hundred years in our country the death rate has been cut in two. The credit for that, in my opinion, is in great part due to public health activities and publicity.

The same means by which such countless lives were saved are in your hands today, but they have not been used to their full possibilities. We must strive ever more vigorously in tuberculosis and cancer control. But if we just apply the methods that are now generally known to be life saving and health producing, as many lives can be saved in the next two decades as were saved in the past century.

I say to you, and it is my conviction, that one of every three deaths among American citizens could be prevented if the utmost in intelligent health education were attained.

The figure is astounding. Think of saving 500,000 lives a year in this great nation of ours! You men who sit at health administration desks and scan the death certificates—you know how many of them carry the tragic story of a life lost that should have been saved.

Hence I say that our aim shall be to sell health. The Lord promised to man, in the Old Testament: "And his days shall be an hundred and twenty years." We should strive to give him his biblical quota, and let him have a century of life, at least. And while we add years to his life, let us be sure to add life to his years, and make them hale and vigorous.

Moreover, we should add lives to the nation by saving babies, preventing epidemics, by carrying our knowledge of health giving and life saving measures to the humblest citizen of the lowliest hamlet in the land.

My plea is that you live health, talk health, sell health and think health. Sell it alike to young and old. Sell it by example and precept; by good health news published in the right way; through the press; by the motion picture, the radio, slogan and poster, or in any other way you will. But *sell* it. Science may outstrip public knowledge, but hygiene must remain to serve the people.

Practical Points about Active Immunization against Diphtheria and Scarlet Fever*

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PROBABLY the most important point at present under discussion in the immunization of children against diphtheria is the preparation to be used. There are four preparations now available: toxin, nearly neutralized with a trace of antitoxin produced in horses; toxin nearly neutralized with antitoxin produced in goats; and toxin modified by exposure to moderate warmth and a small amount of formalin, so that it becomes practically free from toxic action. This is called anatoxin or toxoid; and finally toxin modified by the action of formalin to a lesser extent so that it is chiefly toxic. This is also called toxoid but not anatoxin.

In the United States and Germany, toxin-antitoxin is chiefly used, in France, anatoxin, and in England and Canada the slightly toxic or non-toxic toxoid. The choice of the different peoples is largely accidental and to some degree influenced by patriotic reasons rather than by the especial value of the product.

Ramon recently has contrasted the virtues of anatoxin with the drawbacks of toxin-antitoxin.¹ The recognized importance of Ramon's opinion because of his having developed anatoxin causes us to consider his objections in detail.

His first objection is that toxin-antitoxin is very difficult to make and that because of this difficulty serious accidents have occurred and probably will occur in the future from its use. Having produced both preparations, we are certain that both are made without difficulty by experienced workers.

As to accidents, there have been three major ones and one minor. The first major accident was at Dallas some years ago, where through

* Read before the Health Officers Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 17, 1928.

a mistake a preparation was sent which contained a large amount of free toxin and a number of deaths occurred. The next was in Vienna, where due to carelessness vials of dilute toxin were sent out which were of similar appearance to those holding toxin-antitoxin. Some of these were used in place of toxin-antitoxin with serious results.

The third accident was in Australia where toxin-antitoxin was sent out without any antiseptic. This was contained in rather large bottles from which the product was taken from time to time for the injections. The third drawing from the contents of one bottle taken some days after the first caused a number of deaths. The examination showed that the fluid was badly contaminated by virulent staphylococci. The first two drawings from this bottle had produced no injury, so that it must have become contaminated during the second drawing. These accidents were all due to carelessness and certainly had nothing to do with the nature of the preparation.

The minor accident happened in Boston several years ago when the surprising fact was discovered that freezing of the old preparation temporarily separated from its combination in the toxin-antitoxin enough toxin to cause on its injection serious but not fatal reactions. This separation does not take place with the present universally used 1/10 L + mixture. This objection of Ramon, that the nature of the preparation of toxin-antitoxin leads to accidents, is certainly not founded on fact. We have never had any accidents in New York City from its use in hundreds of thousands of children. Ramon's second objection is that toxin-antitoxin is slow in producing immunity. In our experience, which is quite large, there is no appreciable difference between the two preparations. Different preparations vary in their immunizing potency and, of course, if a good one of anatoxin is contrasted with a poor one of toxin-antitoxin there will be a difference.

Ramon's third objection has more validity and has been voiced by many. It is that the minute amount of horse globulin added to the toxin sensitizes those receiving it to later injections of horse antitoxin or other antibodies, such as are used in tetanus, scarlet fever, meningitis and diphtheria. He fails to realize that the objection if well founded can be easily obviated by substituting goat or sheep produced diphtheria antitoxin for that produced in the horse. This is already being done extensively and on an increasing scale. The goat and the sheep are sufficiently widely separated in species from the horse, so that at least in the amount used their serum does not sensitize persons to later injections of horse serum. Should this change be made? There is no doubt that the percentage of minor skin reactions following intracutaneous tests increases for a time in those who have had injections

of horse antitoxin-toxin, but in several instances where we have had the opportunity of comparing the reaction in large groups of children, there has been no appreciable difference between the reactions in those who had and those who had not had toxin-antitoxin previously. There is also no doubt that reactions due to serum have been improperly laid to sensitization by previous injections of toxin-antitoxin.

Certainly no serologist would agree that such an example as that recently recorded in the *Journal of the American Medical Association* was due to sensitization by toxin-antitoxin. A nurse one year after having been immunized with toxin-antitoxin developed sinus trouble with a possibility of a complicating diphtheria. Ten thousand units of diphtheria antitoxin were given. Four days later she developed a moderate case of serum sickness. Ten days after having received the dose of antitoxic serum she was given another dose of 20,000 units; she immediately developed an alarming attack of serum sickness. There was marked swelling in the tissue of the thigh where the serum was given. This finally progressed to such an extent that local gangrene developed. The sensitization here was certainly due to the injection of the serum given ten days earlier and not to the toxin-antitoxin of the previous year, for otherwise the severe reaction would have developed with the first dose of serum.

While it is true that we are more accustomed to using horse antitoxin to add to our toxin and that we do not ourselves fear sensitization, yet because many physicians fear the minute amount of horse serum, we think we should within a reasonable time substitute goat antitoxin for the horse antitoxin. Both preparations give equally good results. It is the antitoxin and not the animal which produces it which is of importance.

The problem remains as to whether goat or sheep toxin-antitoxin or anatoxin is the better immunizing agent. We have found each preparation when properly selected to be equally good. An injection of toxin-antitoxin gives somewhat less reaction in the children of school age, and the toxoid or anatoxin in infants and the younger preschool children. Fortunately, therefore, each health officer can choose the preparation he prefers, and if it has been properly tested for potency in the laboratory, he can count on good results.

The next subject we choose as appropriate to take up is a modification of the Schick test. The extra labor involved in the Schick test has caused its pretty general disuse in the campaign for the active immunization of preschool children, and in country districts in the school children also. Five years ago we tested the possibility of using the first dose of toxin-antitoxin as a test for immunity as well as an

immunizing agent. We found that the properly standardized preparation of which the injection of 1 c.c. would usually cause the death of a 250 gm. guinea pig, would serve the double purpose. It should be given strictly subcutaneously and as superficially as possible. We found the anterior part of the arm just above the elbow the best place for the injection. Anatoxin cannot be used for this purpose, as the reaction due to its injection is produced by other proteins and not by diphtheria toxin. In young children the toxin-antitoxin reaction parallels the Schick reaction. In older children there is a 10 to 20 per cent increase of positive reactions. Some of these are persistent pseudo reactions. The error if present is on the right side. The reading of the reaction should be delayed until the 6th or 7th day to allow the pseudo reactions to largely disappear. Inspected on the 6th or 7th day, the children showing a reaction are given a second dose, while those showing no reaction are allowed to go without further treatment. A week or 10 days later, the third injection is given. In those using this method for the first time, it is well to control the test in some of the children by an additional Schick test. We have found this method a very useful one where the Schick test is not to be done. It is in use in the public schools and in the baby health stations in New York City. This test should not be substituted for the Schick test in a retest.

The Retest—As three injections of even the best preparations of toxin-antitoxin or of anatoxin or toxoid do not give over 90 per cent immunity on the average, a retest should always be suggested. If the offer is not accepted, the health officer has at least done his part. Without this test, no parent is certain that the child is immune. The retest should not be done earlier than the end of 3 months, as some children are slow in developing immunity. With a retest a control test is always advisable.

Should those who have once been successfully immunized be re-injected in later years? Our experience has taught us that there is a slight tendency for a small percentage of cases to gradually revert to their former positive condition. It is very hard in cities to follow the children. They leave their institutions or move to new homes and addresses are lost. We have been able, however, to follow a few children and a much larger number of adults. The following summaries give the results of retests made 8 years after the original injections.

THE PERSISTENCE OF A NEGATIVE SCHICK TEST IN CHILDREN WHO
WERE IMMUNE THROUGH NATURAL CAUSES OR WHO WERE
IMMUNIZED BY TOXIN-ANTITOXIN

Eighteen infants and young children who gave a negative Schick test in 1919 when retested in 1926 were all negative.

Twenty-five infants and young children who were positive in 1919 and received 2 injections of toxin-antitoxin when retested in 1926 gave negative reactions in 23, a positive reaction in 1 and a doubtful reaction in 1. This was probably a pseudo reaction.

Either 92 or 96 per cent retained their immunity.

THE PERSISTENCE OF A NEGATIVE SCHICK TEST IN ADULTS WHO WERE IMMUNE THROUGH NATURAL CAUSES

Twelve hundred and ninety-five adults tested in 1920 gave 1,115 negative reactors with no pseudo reaction and 180 negative pseudo reactors.

At the retest in 1928 the 1,115 which had given no reaction gave the following results: 990 were absolutely negative, an additional 144 were negative but gave a protein or pseudo reaction.

Forty-nine gave a positive reaction without a pseudo reaction and 32 gave with a positive reaction also a pseudo reaction.

The results indicated that 93.4 per cent retained their naturally acquired immunity for 8 years.

The 180 which were considered to have given a negative pseudo reaction showed the following results at the retest in 1928.

Fifty-eight gave negative reactions; 91 gave pseudo reactions; 7 gave positive reactions; 24 gave combined reactions; and 83 per cent remained immune.

THE PERSISTENCE IN ADULTS OF ACQUIRED ACTIVE IMMUNITY AS SHOWN BY A RETEST 8 YEARS LATER

One hundred and seventy-eight adults originally giving a positive Schick test became negative in 1920 after 1 or 2 series of 2 injections of toxin-antitoxin.

Retested in 1928 the following results were obtained:

	Per cent
81 were negative without pseudo reactions	45.5
30 were negative with slight pseudo reactions	16.8
34 were probably negative with marked pseudo reactions	19.0
33 were positive with or without lesser pseudo reactions	18.5
	62.3
	81.3

We find therefore that 62 per cent retained their immunity and that an additional 19 per cent probably did. It is fair to consider that at least 75 per cent of those actively immunized retained and 25 per cent lost their immunity obtained through the stimulus of toxin-antitoxin. There is a possibility that this immunity may have been reinforced in some way by their having become carriers of diphtheria bacilli at some time during the 8 years.

The results of these tests suggest that the lapses are not great enough to make it necessary to reinject or retest as a public health measure. Children seem to hold their immunity somewhat better than adults, possibly because non-immune adults have shown a resistance to the natural causes which produce immunization. We must remember that in time of exposure we are never certain that a person's immunity has persisted.

Is a negative Schick test a guarantee of immunity? We have not space to consider this fully. If there is sufficient antitoxin in the skin

of a child to neutralize an intracutaneous injection of one-fiftieth of a minimum fatal dose of toxin for a guinea pig, we do not believe that a child can develop diphtheria. Nevertheless, we should always advise that antitoxin should be given in any child really suspected of having diphtheria. Why? The technic of the injection of the diluted toxin may be incorrect in a given case such as the needle going a little too deep or the full amount of fluid not being delivered or the toxin may have lessened in potency because of aging or because of being preserved in improper glass. We must not think, on the other hand, that because a case has a positive culture the case is necessarily one of diphtheria. A case of tonsillitis due to other germs can perfectly well be a carrier of either virulent or non-virulent diphtheria-like bacilli.

ACTIVE IMMUNIZATION AGAINST SCARLET FEVER

It is doubtful whether we have made striking progress since Gabrischewsky in 1907 proposed the use of a vaccine made of the culture fluid and streptococci. Since his first dose of 0.5 c.c. of vaccine produced a rash like that of scarlet fever in 13 per cent of the children, it probably contained between 2,500 and 5,000 Dick skin test doses. As the second dose was double the quantity of the first, and the third was double the quantity of the second, he probably gave in the three injections about 25,000 skin test doses. Gabrischewsky died shortly after he published his results; but his work has been carried on by others. They report that the vaccinated children in the villages of Russia where scarlet fever is abundant rarely develop scarlet fever, while the unvaccinated frequently develop it.

The brilliant discovery of the Dicks that the filtrate of the culture could be used when given in proper dilution as a test for immunity in the same way as the Schick test for diphtheria, enabled us to decide on those who needed immunity; gave us a method of determining the duration of immunity; and allowed us also to estimate the amount of toxin given in the immunizing injection. It was found that moderate amounts given in three to five doses at intervals of 1 week or more produce immunity in a short time in the vast majority of children.

EARLY IMMUNIZATIONS IN NEW YORK CITY

Our earliest attempts to immunize children were made with comparatively small amounts of toxin. At first we gave only 1,500 skin test doses divided into three injections. We found fairly good results so far as immunization was concerned, but it did not hold. We then increased the amount to 4,000 and then to 12,000. We got very good results with 12,000 skin test doses divided into five injections. These were: 700, 1,200, 2,100, 3,000 and 4,000 skin test doses. At the end

TABLE I

RESULTS OF INJECTING 200, 400 AND 800 SKIN TEST DOSES AS SHOWN BY RETEST 5 AND 13 MONTHS AFTERWARDS AT ST. DOMINICKS

Original Retest at 5 months %	13 months %
One hundred + + = 0	+ + = 20 very susceptible
positive cases + = 8 = 9.8	+ = 9 susceptible
of St. Dominicks ± = 27 = 33.3	± = 14 doubtful
Test by — = 46 = 56.8	— = 57 immune
Dr. Schroder	—
Total 81	Total 100

of 4 weeks, 91 per cent of the children gave negative Dick tests and 7 per cent gave doubtful tests, leaving only 2 per cent definitely positive. Even with these larger doses we found immunity did not last beyond 6 months in many of the more positive children. We then still further increased the amounts with the hope that the duration of immunity might be greatly increased. The doses we are now using are 1,000, 5,000, 10,000, 15,000 and 15,000 to 30,000 skin test doses. The injections are given at weekly intervals or at slightly longer intervals.

The following three tables give an idea of the changes which have taken place in dosage during the past few years. Similar changes have taken place in the practice of others. Thus in the *Journal of the A. M. A.*, May 16, 1925, the Dicks give a table showing the increased amount of immunizing power of different doses. Thus when 1,000 to 2,000 skin test doses are given they find 14 per cent of the children become completely immunized; when 5,000 to 6,000, 66 per cent, and when from 10,000 to 12,500, 91.8 per cent.

Before the publication of this table we obtained some interesting results on retests which are seen in Table I. Although from 1,000 skin test doses divided in 3 injections, we found on retesting at the end

TABLE II

RESULTS OF FIVE IMMUNIZING INJECTIONS AT THE END OF 3½ MONTHS APPROXIMATELY 500, 1,000, 2,000, 3,000 AND 4,000 SKIN TEST DOSES

	After 3½ Months
32 + + or + + 1	1 = + 81% immune
Strongly positive cases	5 = ± = 17% probably immune
	23 = — = 2% probably susceptible
	*3 = ± negative pseudo
37 + or + 1	34 = —
Moderate reactors	*1 = + negative pseudo 100% immune
	*2 = ± negative pseudo
69 + to + + 1	1 = + 91% immune
All positive reactors	5 = ± 7% probably immune
	57 = — 1% probably susceptible
	1 = + negative pseudo
	5 = ± negative pseudo

* 1 + and *5 ± are considered negative pseudo reactions because of an equal reaction in the control neutralized by convalescent serum.

of 5 months no strongly positive reactors remaining, and but 10 per cent of moderately reacting. At 13 months, however, we found 20 per cent again giving strong positive reactions. The Dicks and others had the same experience and so the doses and the number of injections have been mounting until they are giving 5 doses containing altogether over 100,000 skin test doses. These large doses are given wholly with the hope of producing a more lasting immunity in the strongly reacting children. They give to about 98 per cent of positive children a negative Dick reaction. Table II shows that with 10,000 skin test doses very good results for the immediate season were obtained by us. Table III gives the results in our children following larger doses. In the course of another two or three years we will definitely know whether in order to obtain prolonged immunity we should give 100,000 or more test doses.

TABLE III

RESULTS AT DIFFERENT INTERVALS AFTER GIVING LARGER DOSES OF SCARLET FEVER TOXIN
DIVIDED INTO 5 DOSES

No. Children Giving Positive Reactions	Time Since Immunization of Retest	Amount Toxin	Per Cent Immune
40*	6 months	31,000	71
69	8½ months	46,000	84
56	11 months	31,000	68
11	14 months	31,000	82
19	15 months	26,000	80
16*	2 years	31,000	37.5

* The number watched for two years is too small to be considered as determining the average duration of immunity.

The persistence of immunity in those who have become naturally immune is encouraging. Thus we found:

RETESTS ON CHILDREN ORIGINALLY NEGATIVE

Of 140 negative children 27, or 19 per cent, were moderately positive 13 months later. Those cases which show pseudo reactions equal to the toxin reaction are called negative-pseudo although they may be combined.

In the general local treatment of the children receiving the immunizing injections, we have found it useful to give them a laxative on the day of the injection and to apply wet dressings, usually using boric acid solution, to any children who show an inflammatory reaction in their arms. With these doses we have not had any general rashes develop but the first and second doses sometimes cause a local inflammatory reaction and sometimes vomiting and a rise of temperature.

The Russians still continue to give with the toxin the dead streptococci as first suggested by Gabrischewsky. Whether this method has any appreciable advantage over the pure toxin is doubtful. The aim is to develop antibacterial as well as antitoxic immunity. Some of the American biological plants also distribute such a vaccine. The Larsen preparation of toxoid has been employed by many. We have

found that four or five doses are required to obtain nearly 100 per cent of immune children. It does not seem to us to have any advantage over the toxin.

THE CONTROL TO THE DICK TEST

In making careful tests for immunity to diphtheria, we give alongside of the Schick test a control test of heated toxin. The toxin itself is slow in developing a reaction and this does not reach its height until the 4th day, while the protein substances left in the heated toxin produce in sensitized persons a quick reaction which is generally of short duration, although in a few cases it may persist for several weeks. With the Dick test the toxin acts like the pseudo reaction in the Schick test as well as that from the control heated toxin in the Dick test—that is, the Dick test and the control test give identical reactions which show their greatest extent at the end of 24 hours. It is therefore impossible to be sure when the control test is similar to the Dick test whether it is a pseudo reaction indicating immunity or a combined reaction indicating susceptibility. In children who have received no vaccination, there are few pseudo reactions, but in those who have received the large injections of vaccine now in vogue, we get a good many pseudo reactions. An added difficulty is that even boiling for 3 hours does not destroy all the toxin. This is determined by the fact that the apparent pseudo reaction in some children is prevented by mixing the boiled toxin with scarlet fever convalescent serum. There is a considerable difference in the amount of pseudo reactions developed by the injection of different preparations.

THE RELIABILITY OF THE DICK TEST

The Dick test in our opinion is almost, but not quite, as reliable as the Schick test. The same care must be taken that the toxin is properly standardized and that it is placed in vials of proper glass. The toxin is more resistant than the diphtheria toxin and can be distributed already diluted. The difficulty with the Dick test is that, as the toxin can only be properly tested in the skin of human beings, it is not apt to be as thoroughly tested as the diphtheria toxin. Also because there are other streptococci which belong to different types which cause fever and scarlet rashes, these may infect those who give a negative Dick test. Such streptococci are, however, in a great minority. The Dick test as a retest is less reliable because of the occasional difficulty of separating the toxin reactions from the pseudo reactions. The occasional errors are however on the safe side.

How generally should scarlet fever vaccination be employed? This is a very debatable question. In the first place, scarlet fever at

the present time is a rather mild disease in most sections of the country. The deaths in New York City, for instance, are less than 1 in 100,000 persons. The cases, however, amount annually to 10,000 to 20,000. The five doses of the toxin are also a disadvantage. While immunization is rapid it is not always lasting with our present dosage in those who were strongly positive. We cannot yet expect to develop an immune population. In a personal communication the Dicks inform me that the injection of a total of 100,000 or more skin test doses divided in five injections produces an immunization in about 98 per cent which lasts for at least 2 years. At present therefore we only urge that it be given to all nurses who expect to be in contact with scarlet fever and to all children in institutions. We advise that it be used in schools and families where exposure to scarlet fever is imminent because of outbreaks in the neighborhood. When a case of scarlet fever breaks out in a family or institution, we prefer to do a Dick test on the inmates and to begin active immunization of those who have been exposed or who may be exposed rather than to give scarlet fever antitoxin. The scarlet fever antitoxin only gives an immunity lasting from 10 days to 2 weeks, and at present is more apt to produce serum sickness when injected into human beings than does diphtheria antitoxin.

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Industrial Fatigue*

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THE conventional attitude toward industrial fatigue carries with it the implication, however latent, that work is a health liability and that fatigue is a functional disease superinduced by work, and that, therefore, any move toward a shortened workday or work week is in the direction of greater freedom, health, and happiness. My concept of fatigue carries the implication that work, within reasonable bounds, is one of the greatest stabilizers of health that we have; that fatigue, which is not superinduced by a condition of physical impairment and deficiency, is a part of the normal rhythm of life and a condition to be welcomed as one necessary in maintaining the balance of mental and physical health.

It seems first necessary to arrive at as clear an idea as possible of what is meant by industrial fatigue. As shown by a study of the *Bibliography on Industrial Fatigue and Allied Subjects*,¹ fatigue researches heretofore have been directed almost wholly to the supposed effects of industrial work upon the muscular or nervous state of the individual, and practically the only attainable criterion has been that of the work curve.

There is a preponderance of opinion in favor of the thesis that industrial fatigue arises in the nervous system rather than in the muscular system. However that may be, it seems desirable that the study of physiological fatigue—the reaction of the worker to any form of work or environment—should be studied in groups reasonably normal as to their physical state as compared to groups showing some departure from the normal which might conceivably be either partly or chiefly responsible for either an unfavorable work curve or a conscious state of fatigue in the individual.

At the present time the trend of opinion seems to be against the view that there is any specific fatigue toxin affecting the muscles and it may well be that a variety of toxins derived from bacterial action rather than from muscular work affects both the nervous system and the muscular system.

* Report of the Committee for the Study of Industrial Fatigue, presented to the Industrial Hygiene Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 16, 1928.

It is rather remarkable that in the 440 references given in the Bibliography¹ there are only 9 articles which deal specifically with the intrinsic factors contributing to fatigue—those present in the individual at the time of going to work as contrasted with environmental factors such as the nature and degree of work or working conditions—and there were 10 touching lightly upon these intrinsic factors. The balance are devoted wholly to the consideration of extrinsic or environmental factors as responsible for that impairment of working capacity which has been loosely termed "fatigue." Evidently here is a fertile field for research and for a readjustment of the attitude toward the whole subject of fatigue study.

So comparatively negligible a factor as the color of the walls in a work room has been given serious consideration, while the possible influence of such definite conditions as septic tonsils or defective vision as a factor in fatigue has been given little attention. If more than half of the people in such a room have faulty vision, uncorrected—as we find to be true in average groups—which is more important, to seek out this faulty vision and correct it or merely to mitigate the fatigue of these strained eyes by changing the color of the walls?

The ideal advanced by certain efficiency experts in finding the one best way of doing a piece of work in industry may have some merit. But the fundamental need is better expressed in the ideal of attaining the best physical and mental state in which to do this work.

The conventional view arises from the unfortunate fact that in industry it is too generally assumed that there are 2 classes of people, the sick and the well. That the majority of workers who do not report on the sick list are far below a condition of physical efficiency is a factor too generally ignored. It needs but little thought or examination of the subject to convince any reasonable man that there is a wide range of possible intrinsic factors affecting the work curve which have nothing at all to do with the hours of work, the kind of work, or the environment in which the work is carried on. It is indubitably true that a half-sick man will be benefited and his work curve improved by mitigating, through improvement of his environment, the demands made upon him. But the question may be sharply raised as to whether or not this is a method leading to a fundamental or maximal correction of those manifestations grouped under the term "industrial fatigue."

I am pleading for a balanced study of this whole fatigue question in which each line of research shall be properly weighted. The physiological studies must be continued. However, these studies seem less important than the larger objective of ascertaining the total

physical condition of any working force, and of estimating what sources of waste, inefficiency, and non-productivity there may be in actual physical disability, especially that not reflected in the absentee rate or sickness rate.

Attention is called to the great importance in industry of detecting what is termed "silent sickness," the chronic disease which actually contributes more heavily to the death rate than the acute types of disease reflected in the absentee rate in industry. We should ascertain the part played by these chronic maladies in lessening the efficiency of the industrial worker and shortening his work cycle.

In certain lines of industry true fatigue is a major problem; that is, assuming that all workers engaged in a particular industry were fully up to standard physically, there would be in that group a strain involving the nervous and muscular systems that would constitute a real problem and require adjustment of working conditions and working hours. In all plants it is a consistent and meritorious objective to adjust both working hours and methods on the best possible plane. What that plane is, however, is difficult to determine without specific studies.

It seems highly desirable to investigate the work reaction of representative groups of employes, ranging from those who upon careful examination appear to be in a state of comparative freedom from physical defects or mental or nervous insufficiency to those who are really seriously impaired. The entire range of these possible conditions will be found in any fair sized group of working people who have *not* reported on the sick list and are supposed to be just ordinary healthy workers.

One of the most striking instances of an intrinsic factor affecting the work curve was revealed in the studies made by the U. S. Public Health Service² in the investigation of acid sodium phosphate in delaying the onset of fatigue. Emden³ reported a favorable effect of this substance in delaying the onset of fatigue among soldiers during the late war, and it was assumed that it constituted a chemical antidote to fatigue poisons or supplied some chemical lack in the working muscle.

The result of these experiments indicated that acid sodium phosphate did not appear to increase muscular efficiency but that it induced a feeling of well-being especially among those who were somewhat below par when the experiment started. This, in the judgment of the investigators, was at least partly related to the correction of intestinal stasis. There was noted a distinct improvement in the bowel function among those using the phosphate.

The significant fact bearing on the thesis of this paper is that 80 per cent of the people in the group investigated suffered from a physical disability that was manifestly reflected in lowered physical efficiency.

The difficulty of determining a base-line from which to judge fatigue and other complicating factors rendered difficult any positive conclusions with regard to the effect of the phosphate on the work curve of the group under consideration, although Emden's conclusions from his own experiments were quite positive as to the beneficial effect on endurance and production.

The question raised by this investigation as to the possible effect of bowel sluggishness in inducing fatigue is worthy of more comprehensive study. Yet constipation is only one among manifold possible intrinsic factors influencing the efficiency and productivity of the employe.

The opinion that merely lightening labor is applying the best remedy to fatigue conditions contains a fundamental fallacy in so far as it relates to correcting that unfavorable deviation in the work curve that is so generally regarded as reflecting industrial fatigue. The proposal is frequently made that we adjust the job to the man. But for a really fundamental solution of the problem, the best approach would be to adjust the man to the job; that is, to study his condition and so far improve it that his working limitations would be expanded, rather than to compromise with his working limitations and let him settle down into a sub-standard job.

It is impossible to consider this question of fatigue without being at once led into the question of the longevity of the worker, his physical efficiency at the various decades of life, and therefore of the final problem of why the worker in industry is assumed to be more or less a liability at middle life and later. There is a certain naivete in so carelessly discussing all of these fatigue states as a reflection of work itself and then accepting the dictum that the worker suddenly, without previous ill health, becomes say at age 50 (on the average) a liability in the plant.

Secretary of Labor Davis has bitterly deplored this traditional attitude toward the man of 50 and speaks of the time when at that age it was customary to give a man a gold-headed cane and gracefully bow him out of the plant. Of course a broader view is taken of this question now and in many plants there is a real effort made to adjust every kind of work to the older workers who have been highly trained and who have served their employers faithfully. This is a very wise policy as far as it goes, but a very unwise policy if it stops there.

Through a right approach the need for adjustment of working conditions to the elderly man will be lessened, or rather the age at which such adjustment is considered important will be pushed forward and the liability point fixed nearer 60 than 50.

These views are advanced in the hope that in all research centers in industrial hygiene where industrial fatigue is given considerable thought, there may be a readjustment of the mental attitude toward this problem and an approach from a wholly different angle than has heretofore been customary in fatigue studies or in efforts toward the mitigation of fatigue.

No one can question the scientific wisdom or the practical sociological value of adjusting working conditions on such a plane that the worker shall have sufficient time for a broader life and for true self-expression. But no real progress is made in that direction by falsely presenting the effect of working conditions on the human organism. Error and misunderstanding on this question will be avoided if the effects of work and environment are measured upon workers graded according to their physical equipment. Then there will be presented a true picture of the man at work.

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Emden, Grafe and Schmitz. *Ibid.*, p. 67.

German Work for Psychopathic Children

SPECIAL provision for the welfare of psychopathic children is made by the municipal children's bureau in every large city in Germany, in accordance with the federal child welfare law of 1922, which constituted this work as a function of these bureaus. The work in each city is in charge of a psychiatrist, who is aided by trained visitors, and it is done in close coöperation with public schools, juvenile courts, and other agencies interested in child welfare. In some cities emphasis is laid on change of environment for these children, and they are placed in special institutions. In certain cities special day schools, including kindergartens, are provided for them. In other cities, psychopathic children attend the regular day schools and go periodically to a consultation center, which sends workers to visit these children at their homes. Annual reports from all the municipal children's bureaus stress the importance of psychiatric work as a branch of general child welfare work.—*Ztschr. f. Kinderforsch.*, Berlin, Aug. 25, 1928, p. 522.

The Use of Ultra-Violet Light Transmitting Windows*

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A NEW industry and a new line of selling talk have sprung into being within the past few years. To one informed as to scientific progress in irradiation as a means of controlling lime utilization in the body and of preventing rickets, the promotion of this particular industry is highly important and desirable. The selling talks of salesmen endeavoring to convince prospective customers demand critical evaluation and constructive suggestion to eliminate claims made without basis in fact.

The industry to which I refer is that concerned in producing window material which, correcting a defect of ordinary window glass, will transmit in addition to the illuminating rays those shorter sun rays that are now known to be curative and preventive of the faulty lime utilization designated under the term "rickets."

Pure quartz transmits these ultra-violet rays freely, and the General Electric Company by perfecting a method of producing sheets of clear quartz have given us window material of high transmissibility but, unfortunately for most of us, of very high cost. To meet this cost factor, less efficient window material has been devised by a number of firms, the products ranging from 60 per cent transmission when new, to all values less than 60 as compared with pure quartz. These panes still transmit enough rays to be clinically effective and are much less expensive than quartz, though at present considerably higher in price than ordinary window glass. It was soon found that by use these glasses lose to a degree their original transmission values, the change being designated as "solarization." The extent to which this change is possible becomes a factor in evaluating different market products in this field.

During the past eight months my laboratory has been engaged in testing the product of one of these glass manufacturers and also in conducting tests on the efficiency of an installation of the same glass

* Read before the Food, Drugs and Nutrition Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 17, 1928.

in a school building in a neighboring village. Before reporting the character and results of these tests I would like to review some of the information and unsettled points on the subject in order that the scope and significance of the tests themselves may be more apparent.

There seems to be general agreement among experts¹ that rays longer than 3,130 Angstrom units have little antirachitic value ($313\mu\mu$); * also, that while protective action is exhibited by rays shorter than $313\mu\mu$, and such rays are obtainable in artificial sources of ultra-violet light such as the mercury arc lamp or carbon arc lamp, the shortest rays that reach the earth from the sun are $290\mu\mu$ and, due to absorption by the atmosphere with its moisture, dust and smoke and the varying distance of the sun from the earth, sun radiation often contains none shorter than $300\mu\mu$. These facts prove that if we propose to use the sun as our source of protective ultra-violet rays and to strain it through window material, the latter's transmissibility of the rays from 313 – $300\mu\mu$ is what vitally concerns us. To show us that a window transmits rays below $300\mu\mu$ may be of importance if we are going to use artificial sources, but if the sun is to be our source, there will be no shorter rays to transmit. Similarly, transmissibility of longer rays than $313\mu\mu$ may tell us that the window is a better transmitter of illuminating rays, but these rays have no bearing on our seeking antirachitic power. These facts definitely delimit one criterion of selection in buying ultra-violet transmission material.

Today it is also generally agreed that there exists in our bodies and in certain foodstuffs a chemical substance designated as "ergosterol." Except in a few foods (the notable exception is cod liver oil), the ergosterol as it is found has no antirachitic power, but when it has been treated for a sufficient length of time to the action of the short rays (rays of $313\mu\mu$ – $253\mu\mu$ are now known to activate it), it becomes converted into what we call vitamin D and in this activated form controls the utilization of calcium in our bodies, prevents rickets and dental defects and generally supervises and adjusts our use of lime. When foodstuffs which contain the inactive ergosterol are irradiated with the short rays their ergosterol becomes vitamin D and the foods become antirachitic. When the body is irradiated with these short rays the ergosterol which is in our skin undergoes a similar activation, and after its probable absorption into the blood travels to the points where it protects us against rachitic troubles.

We may take cod liver oil with its already activated ergosterol;

* The length of light rays is usually expressed as millimicrons (a millimicron is one thousandth of a millimeter) or in Angstrom units (an Angstrom unit is one ten-millionth of a millimeter). Hence, in the literature a wave length may be given as $313\mu\mu$ (millimicrons) or $3,130\text{ \AA}$ (Angstrom unit abbreviation). In this paper we will use millimicrons as the unit abbreviated as $\mu\mu$.

we may eat irradiated foods with their activated ergosterol; or we may create this vitamin out of our own ergosterol by exposing ourselves to the short rays. In the last selection we must be sure that the rays reach the ergosterol in the skin, and their penetration power is very low, 1-2 mm. Clothing, dust and moisture absorb them.

Can a fully clothed individual, then, sit 6 or 8 feet from a short ray transmitting window and receive on his skin, most of which is covered by absorbing material, enough rays to do him any good? Must he sit in the direct path of the rays? Will reflected rays be of any value or are they wholly or in part absorbed when they strike the reflecting surfaces? These are practical queries, the answers to which determine: what rooms can be equipped to advantage with such window material; how to use them on baby and adult; and what care to give them to avoid nullification of value by films of dirt or moisture.

Does the mere presence of short rays of given length determine activity and protection? Marshall and Knudson² have recently confirmed by new experiments the evidence that intensity is quite as important as wave length. Using three wave lengths (302.2, 280.4 and 253.6 $\mu\mu$) they report that in small energy doses the effect is independent of the wave length but that prolonged irradiation may actually destroy the power that a shorter period has created. We must then have a certain intensity of irradiation. At certain seasons of the year the sun's rays may contain active waves ranging from 290-313 $\mu\mu$, but the intensity of these activating rays is widely different. Fabry and Boisson³ found at Marseilles that rays of 314.3 $\mu\mu$ were 750,000 times and rays of 302.2 $\mu\mu$ 90,000 times as intense as the shorter rays present in sunlight. Transmissibility to 290 $\mu\mu$ may insure full intensity of the available sun rays, but higher transmissibility of rays from 300-313 $\mu\mu$ might make a more practical window, range being in part compensated by intensity.

How many hours can a naked baby lie in front of a window in direct sunlight with benefit and without injury? Is the time the same in June as in December? Data given in a published address of Dr. Hess⁴ show typical seasonal and diurnal variations to be expected in the active rays of the sun. Hess shows that from December to February the amount of effective rays is much reduced and confined to a much shorter period of the day. The months when we need the windows most because of weather and temperature are those of least potent solar content. Bundesen and coworkers⁵ found comparatively little ultra-violet of physiological value in the sunlight of Chicago during the winter months. Tisdall and Brown,⁶ however, showed in Toronto that December sun contained enough to be protective of test

animals, and Fleming¹ in Washington, D. C., during December, 1927, and January, February and March, 1928, showed that not only was there enough of the rays present in the sunlight to protect test animals but that enough passed through Vitaglass, a typical window product, for this purpose.

This brief review is perhaps sufficient to explain the points which must be in mind in testing the efficiency of any sample of window material and to indicate the scope of the tests reported below.

Series I—To determine the efficiency of Vitaglass installation in a schoolroom in the vicinity of New York City during the months of January and February—This series of tests was conducted at the request of Superintendent of Schools Beattie of Bronxville, N. Y. Certain rooms having been equipped with Vitaglass windows, definite evidence as to their clinical efficiency was sought. Two of the rooms had almost identically the same exposure and differed only in the type of window glass, one being equipped with ordinary glass and the other with Vitaglass. In the Vitaglass room four cages of rats were distributed, one on the window sill in the direct path of the sun, one on a shelf on the window ledge but out of the direct path of the sun, a third on a shelf at the side of the room, and the fourth on a table at the back of the room. The other two cages were placed in positions in the ordinary window glass room corresponding to the first two locations given above. The rats in these cages were fed on Sherman-Pappenheimer² rickets producing diet No. 84. The installation was made on January 18, 1928, and the test was run for 30 days, ending February 16. It was felt that the positions of the rats corresponded to regions which pupils would occupy from time to time; that they would permit comparisons of indirect with direct light effects with and without Vitaglass; and that the clinical evidence of actual rickets prevention would be more convincing, if obtained, than mere data as to transmission and quantity of curative rays entering the room.

No evidence of protective action was obtained in any of the rats except the one directly in front of the window in the Vitaglass room. This rat was fairly well protected. None of the others in the entire period received enough curative rays to prevent acute rickets.

Series II—To determine whether in New York City during the period of spring in which schools are in session the atmosphere contains enough curative rays to be of significance—The Vitaglass Company was sufficiently interested in the evidence gained in the above test to ask that we conduct a series to settle the above point. A laboratory in the university, used by my department, has three windows facing south. The sashes of two of these windows were removed and

replaced by two Vitaglass panes each. By building a shelf in front of these three sashes on which to place rat cages, and by using screens to cut out cross rays (the set up is shown in the picture on page 1477) it was possible to measure the preventive action of transmitted rays through each of four panes of Vitaglass and through window glass as recorded by the rat occupants of these cages on a basal diet of rickets producing power (Sherman-Pappenheimer No. 84). Three 30-day tests were run. The first extended from about March 1 to April 1; the second from April 5 for a little over 30 days, extending through April into the first of May; the third series ran from May 20 to June 20. We were told that two of the Vitaglass panes were supposed to be solarized, but not which panes they were. In every series the rats received the direct rays passing through the south windows and, except for the windows, were protected from them only by the wire mesh of the sides and tops of their cages.

The first and second set of tests gave us protection for every rat in front of a Vitaglass pane, and the line tests on these rats did not permit differentiation between the four Vitaglass panes. Solarized and unsolarized glasses transmitted enough to prevent rickets. The controls before the window glass showed acute rickets.

During the third set of tests weather reports showed that there were less than 17 days of this period when the sun shone for 4 hours. This effect was evident in the line tests, for none of the four Vitaglass rats were protected though all showed a little more evidence of protection than the controls.

At the end of the third set of tests the panes of Vitaglass were removed from the sashes and sent to Professor Stockbarger of Massachusetts Institute of Technology, who tested their transmissibility to three wave lengths. The results are shown in Table I.

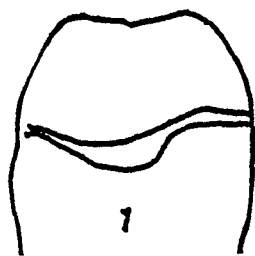
TABLE I
TRANSMISSIBILITY OF VITAGLASS PANES

Wave length	Pane No. 1	Pane No. 2	Pane No. 3	Pane No. 4
$\mu\mu$	Per cent	Per cent	Per cent	Per cent
297.0	29	23	10	15
308.5	51	44	29	36
320.0	70	65	54	59
Thickness	2.2 mm.	2.5 mm.	3.4 mm.	2.8 mm.

EXPLANATION OF CHART I—THREE SETS OF VITAGLASS TESTS

Protection against rickets is shown by the "line test." The drawings in the chart are camera lucida drawings of the split ends of rat knee bones. The narrowness of the "line" between the end of the bone and the shaft indicates degree of protection. The narrower the line the higher the protection. Set 1 was made in March, 1928; Set 2 in April, 1928; and Set 3 in May and June, 1928. The numbers 1, 2, 3, 4 indicate animals that were in front of "Vitaglass." The numbers 5 and 6 indicate animals that were in front of ordinary window glass. All animals were exposed for a period of 30 days.

CHART I



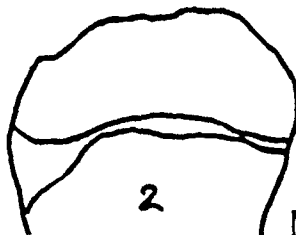
1



3



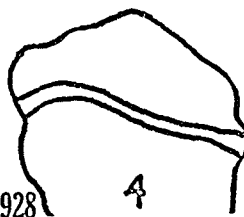
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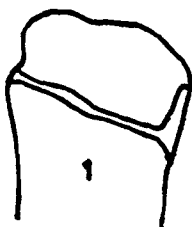
MARCH 1928



4



6



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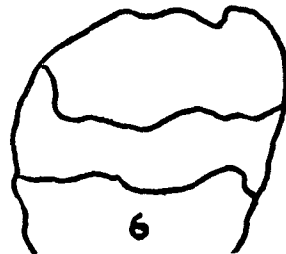
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APRIL 1928



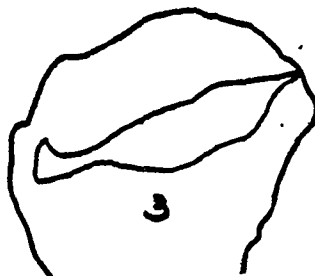
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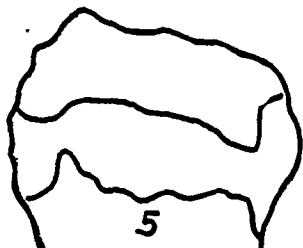
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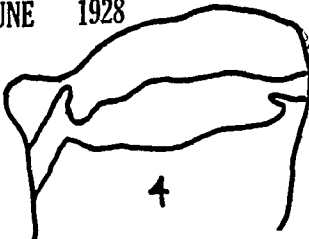
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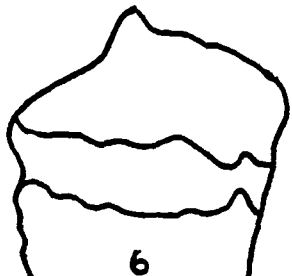
MAY JUNE 1928



2



4



6

Discussion—These tests demonstrate that even with solarized glass, continuous exposure for 30 days admitted with these glasses enough active rays and intensity in New York City to be chemically efficient and clinically active. In combination with the first Bronxville series they demonstrate that with sufficient exposure in the direct path of the sun there is enough curative ultra-violet in these regions in January to April to be clinically effective even when screened by glasses which transmit half or less than half of the available supply.

The May-June result, with rainy weather, illustrates sharply one of the limitations of this system of irradiation.* It also shows clearly that weather may be quite as important a limiting factor as seasonal variation in solar content and intensity. While the series in any period failed to show marked difference between solarized and unsolarized or less solarized glass this does not justify indifference to this phenomenon. It does reassure us that in spite of solarization the glasses do not lose all efficiency even with transmission cut to 25 per cent for the curative rays.

These results speak favorably for the use of these glasses in New York City and vicinity in winter, but at the same time they should make it evident that the user needs specific data as to exposure time or he will be unable to intelligently apply this means of sun therapy. To merely install these glasses in the home, lay the baby in front of them for an hour a day, and assume that this is sufficient insurance against rickets is obviously taking too much for granted.

Series III—To determine whether in the school of Experiment I position of windows was a matter of importance—During April and into May three rooms in the Bronxville school were used in a further test: One room had western exposure, one eastern exposure (both provided with Vitaglass) and a third room with ordinary window glass and eastern exposure was selected as the control room. Two cages of rats were placed in each room, one in front of the window and one on a shelf out of the direct rays. For the period of exposure given, east or west showed no difference; protection of the window rat was complete if Vitaglass was used, and lacking with ordinary window glass.

* In response to inquiry by the Vitaglass Company, the following report was received from the Carnegie Institution of Washington, Mount Wilson Observatory, Pasadena, Calif.

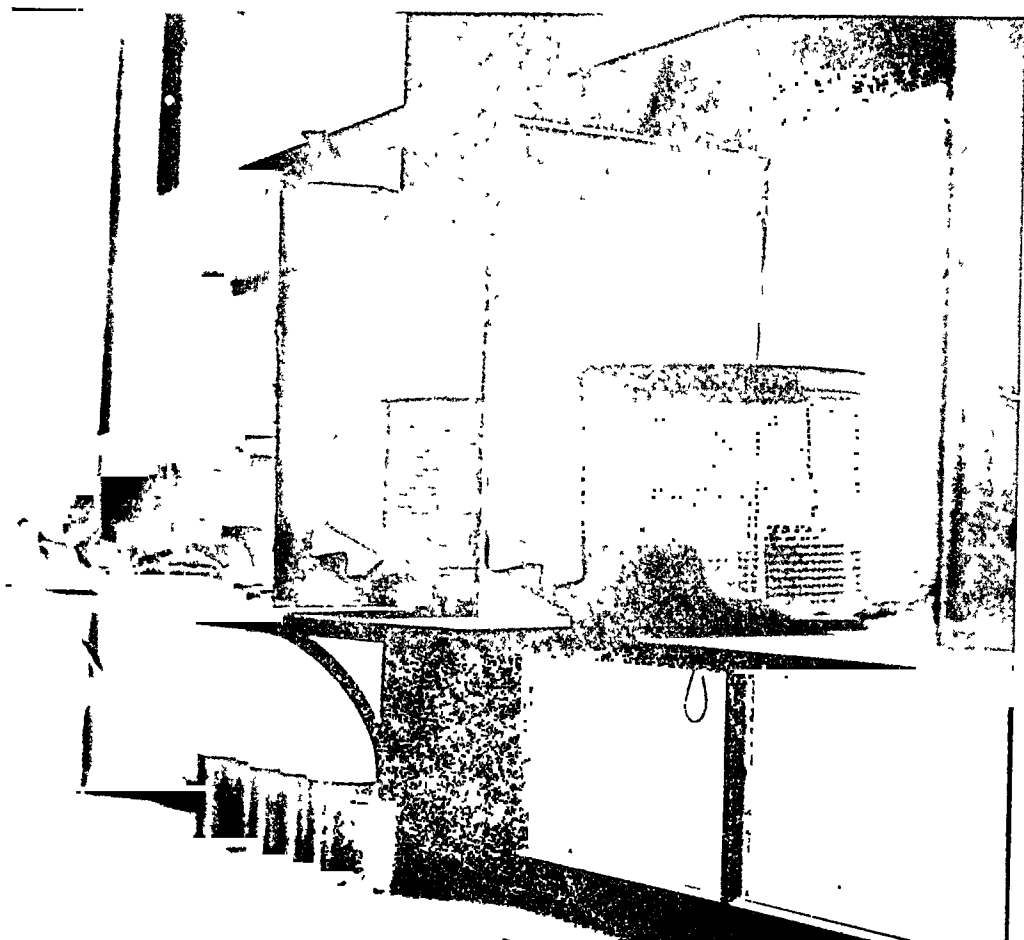
"The following are the monthly averages of the ultra-violet (0.32μ) light in the sun for the dates you request

Feb 1928	1 28
Mar.	1 30
Apr.	1 30
May	1 20
June	1 22

You will note a general drop of about 7 per cent in May and June

"At 0.32μ the effect of complete cloudiness is ordinarily to reduce the intensity of sun plus sky to about 25 per cent of its value on a good clear day. During stormy weather it may drop to 15 per cent.

(signed) Edison Pettit "



VITAGLASS EXPERIMENTAL WINDOWS IN LABORATORY OF TEACHERS COLLEGE,
COLUMBIA UNIVERSITY

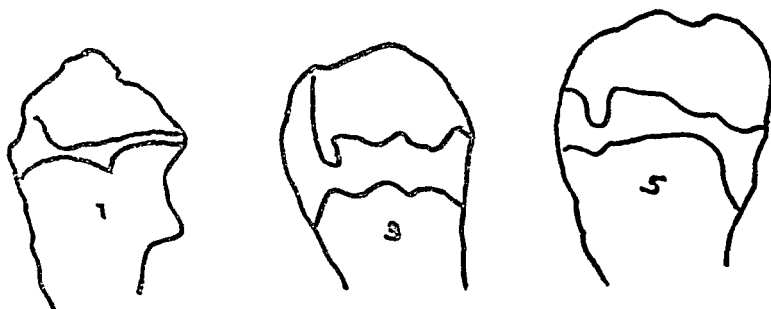
The shelf animals in the Vitaglass rooms got no protection.

Using a different method of measuring window efficiency, Janet Clark has⁹ recently reported and commented as follows:

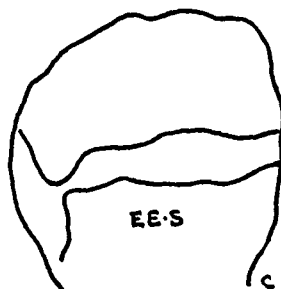
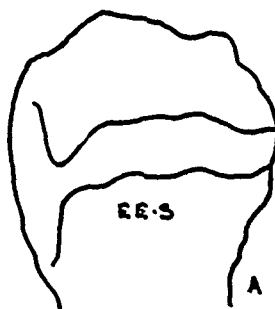
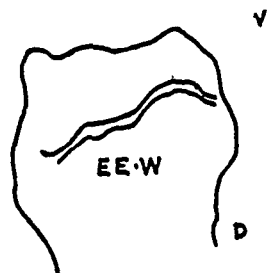
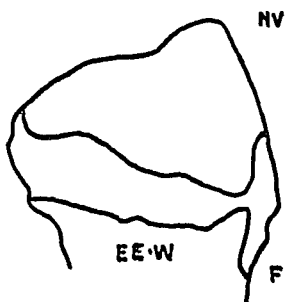
A table of data obtained in this way on perfectly clear days at noon, during March, April and May, 1928, shows that although the intensity of ultra-violet irradiation increases from March to May, it is still necessary to sit about 15 hours at 5 meters from a north window of ultra-violet transmitting glass to get as much ultra-violet radiation as can be gotten by 2 minutes out of doors in direct sun at noon. . . . Any child going out of doors for recess, or any stenographer going out to lunch will get more ultra-violet radiation than she could get all day behind a window of ultra-violet transmitting glass. So although these materials have an undoubted field of usefulness in solariums, and probably in animal houses and zoos, it is unnecessary to put them in schools and offices where it would be cheaper and more efficient to send the individuals concerned out into the sunshine for a few minutes every day at noon.

Our tests are positive in showing that schoolrooms so equipped admit enough ultra-violet in winter months to heal or prevent rickets

CHART II



JAN. FEB. 1928 **1**



APRIL MAY 1928 **2**

EXPLANATION OF CHART II—SCHOOLROOM TESTS MADE IN BRONXVILLE, N. Y.

Series 1—The animals from which these bones were taken were placed in schoolrooms in positions similar to those that children occupied with the exception of No. 1, which was placed on the windowsill directly in the path of light. Specimens 1, 2, 3, 4 and 5 were all located in a room equipped with Vitaglass windows. Specimen 6 was in a room with similar light exposure but equipped with ordinary window glass. Note that during the period of exposure, from January 18, 1928, to February 16, 1928, the only rat in any way protected was No. 1, the rat directly in the path of the Vitaglass window rays.

Series 2—During May and June the tests were repeated at Bronxville with this modification. WE represents specimens from rats in a "western exposure" Vitaglass room. EE represents specimens from rats in an "eastern exposure" Vitaglass room, and in an "eastern exposure" ordinary window glass room, the right hand series being the Vitaglass room group and the middle series the window glass room group. The attached letters W, S and T indicate the position of the rat. The W specimen was on the windowsill in direct path of rays. The S and T rats were on shelf or table in same room but out of direct path of rays. Again only those animals in direct path of rays were protected and then only when in front of Vitaglass.

if weather is clear and exposure long enough; and that only that part of the room directly in the path of the rays receives this benefit. With these facts in hand it is for school boards to decide whether the benefits derivable justify the expense of installation. My own feeling is that schools and office buildings would invest their money more efficiently by equipping solaria, preferably with sky lighting and sex-segregated so that the needy cases could lie exposed for certain periods of the day to the full effect of the sun, with as little clothing as possible. I do see a place in homes and apartments for these glasses to permit mothers to save some hours of perambulation with the baby or chaperonage of small children.

The glasses are important inventions. It seems a pity to detract from their values and discourage their perfecting as aids to health by false claims or misdirected selling campaigns. Their purveyors will therefore do well to stress instructions as to where to install and how to use, rather than quantity sales, at least until the public is educated to their values and limitations.

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Longevity of Typhoid Bacilli in Cheddar Cheese*

A Study Following an Outbreak of Typhoid Fever Traced to Cheese

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CHEESE has been reported very rarely as a factor in the transmission of typhoid fever. The only prior epidemic of typhoid fever traced to Cheddar cheese that we have found is that which occurred in Michigan in 1917, and was reported by E. D. Rich¹ in 1923. In that epidemic there were 51 cases with 4 deaths. Two epidemics of gastroenteritis are reported by Linder, Turner and Thom,² a streptococcus pathogenic for cats being responsible; one was due to imported Albanian cheese and one to American Cheddar cheese.

During February, March and April of 1925, an epidemic of 29 cases of typhoid fever, with 4 fatalities, was reported from 8 sanitary districts of 4 counties in Minnesota. The first case developed symptoms February 2, and the last April 3.

Epidemiological investigations made by the department showed the source of infection to be cheese made in a coöperative cheese factory on January 11 and January 12. This cheese was noted by the cheesemaker as having what is commonly called "dead curd." The acidity of the milk could not be increased by any of the usual methods, and the result was a very soft cheese. As the creamery had many requests for fresh cheese, this lot was distributed as early as 10 days after making, instead of being held to ripen as is usually done.‡

The epidemiologist found evidence pointing to a carrier in the family of one of the contributing patrons of the cheese factory. Bacteriological findings confirmed this evidence. *B. typhosus* was isolated from 3 specimens of feces received from Mrs. B., age 57, who gave a history of having had typhoid fever in 1900.

* Read before a Joint Session of the Laboratory and Food, Drugs and Nutrition Sections of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 15, 1928.

† Resigned.

‡ On April 16, 1925, there was obtained, from one of the families in which typhoid fever occurred, a piece of cheese said to be part of this same lot. At this time, 95 days after manufacture, the cheese was very dry. The acidity was 0.95 per cent and no typhoid bacilli were isolated from it.

Cheese known commercially as Cheddar cheese is made from whole fresh milk. At this coöperative factory, the following method is used:

The milk is kept at a temperature of 86° F. until the acidity has reached 0.20 per cent. This is hastened by adding commercial starter. When the correct acidity has been reached, coloring matter is added and also rennet (4-6 oz. per 100 lbs. milk). The milk thus treated is allowed to stand without agitation until the curd is firm, at which time it is cut into small cubes and the temperature gradually raised (1° in each 5 minutes) to 98° F. The cubes of curd are gently but continuously agitated to prevent their adhering to each other, until they have shrunk to half their original size and when squeezed together by hand will not adhere. The whey is then drawn off and the curd stacked to drain with temperature maintained at approximately 98° F. The curd is turned every 15 minutes until the cheddaring process is completed, at which stage it has become a homogeneous mass of a texture like chicken breast, and when held for an instant against a hot iron forms shreds 1 to 1½ inches long. This cheddared curd is then cut up fine; salt is added (35 gms. to 100 lbs.), the temperature lowered to 80° F.; and the curd put into the cheese press. On removal from the press, the cheese is dipped in paraffine and stored at about 60° F. to ripen.

Since cheese so seldom has been found to be the source of typhoid epidemics, it was thought desirable to attempt to find out what kills typhoid bacilli in Cheddar cheese, as there seems to be nothing in the heat used or the acidity developed during the process of manufacture which would necessarily destroy these organisms. With this in mind, 18 small cheeses were made following as closely as possible the above method. A galvanized iron pan 15" x 10" in a water bath served for a vat, and a cutting implement was improvised from sheet metal.

For each cheese made, 7 quarts of milk were used. This milk was infected, usually the evening preceding the making of the cheese, with 50 c.c. of an 18-hour broth culture of *B. typhosus*. For all the experimental work, the typhoid strain isolated from Mrs. B. was used. The milk was allowed to stand over night either in the icebox or at room temperature, according to the age of the milk, maximum multiplication of the bacteria without curdling being desired. The finished cheeses weighed about ¾ lb. each and were of good consistency.

For the most part, one cheese was made on each of 3 successive days, using the same lot of milk, which was kept in the refrigerator until needed. Raw milk was used for all except cheeses O, P, R and S, for which pasteurized milk was used. Samples for examination for *B. typhosus* were taken at different stages during the process of manufacture, and at frequent intervals afterwards. After sampling the cheese by means of a cork borer, the hole was thoroughly sealed with paraffine. All samples were plated on 8 plates of brom cresol purple lactose agar, typical colonies fished, checked for cultural characteristics on broth, milk, dextrose and saccharose broth, and for agglutinability with known positive serum.

Samples were taken from each cheese during the process of manufacture as follows: (1) before adding the starter, (2) before adding rennin, (3) as curd was forming, (4) after cutting curd (both whey and curd), (5) on completion of cheddaring (both whey and curd), (6) after salting, and just before placing in press. Samples were taken from the finished cheeses daily, except from cheeses H and K, until three consecutive tests failed to show typhoid bacilli. On cheeses H and K bacteriological tests were made daily for 16 days and then at intervals of 3 or 4 days until the 36th and 34th days, respectively.

Tests for acidity were made daily on all but the first seven cheeses. For all acidity tests of cheese, 5 gm. were emulsified in a mortar with 100 c.c. hot water; 25 c.c. of filtrate were titrated with *N*/10 NaOH, using phenolphthalein as indicator. Table I gives a summary of the cheeses made, the length of time in days that *B. typhosus* was found living in each cheese, and the acidity of the cheese when 1 day old, and when *B. typhosus* was no longer found. All determinations have not been shown, as they would make the table cumbersome.

In each cheese tested the increase in acidity was gradual and *B. typhosus* was continuously present up to the date of first negative findings except in the following 5 instances: In cheeses B, C and E, one examination only failed to show *B. typhosus* before obtaining the

TABLE I
LONGEVITY OF *B. typhosus* IN 18 EXPERIMENTAL CHEESES

Cheese	Date	Milk	Starter	<i>B. typhosus</i> Recovered		Per Cent Acidity	
				During Mfg.	No. Days	24 hours	Day 1st neg.
A	Oct. 29, 1925	Raw	Commercial	All Specimens	6		
B	Nov. 3, 1925	"	"	" "	6		
C	Nov. 4, 1925	"	"	" "	7		
D	Nov. 5, 1925	"	"	" "	4		
E	Dec. 8, 1925	"	"	" "	4		
F	Dec. 9, 1925	"	"	" "	2		
G	Dec. 10, 1925	"	"	" "	6		
H	Jan. 25, 1926	"	<i>S. lacticus</i>	" "	36*	.67	1.04†
K	Jan. 27, 1926	"	" "	" "	34*	.47	.72†
L	Feb. 23, 1926	"	Commercial	" "	3	.68	.83
M	Feb. 24, 1926	"	"	" "	1	.72	.79
N	Feb. 25, 1926	"	"	" "	0	.65	.65
O	April 7, 1926	Past'd	"	" "	6	.76	1.01
P	April 8, 1926	"	"	" "	1	.61	.98
R	June 22, 1926	"	<i>S. lacticus</i>	All except No. 5 whey	3	.72	.86
S	June 23, 1926	"	" "	All specimens	3	.81	.90
T	April 7, 1927	Raw	" "	All except No. 5 whey & curd	0	.83	.83
U	April 8, 1927	"	" "	All specimens	8	.58	1.15

* No later tests, cheese all used.

† Last day of test, *B. typhosus* still present.

3 consecutive negative results. In cheese R one colony of *B. typhosus* was obtained on the 3d day while *B. typhosus* was not found on the 1st and 2d days, and in cheese U no typhoid bacilli were recovered on the 1st and 2d days, but not on the 3d to 8th days, inclusive.

With the exception of cheeses H and K the duration of *B. typhosus* ranged from 0 to 8 days, averaging about 4 days. The acidity ranged from 0.61 to 0.83 per cent when 1 day old, to 0.72 to 1.15 per cent at the end of the tests. From cheeses H and K, *B. typhosus* was recovered on every test until no more material for testing was left, which was on the 36th and 34th days after manufacture, respectively. Cheeses H and K had acidities of 0.67 and 0.47 per cent, respectively, when 1 day old. Cheeses L and P had practically the same degree of acidity as cheese H, yet *B. typhosus* survived in them but 3 days and 1 day, respectively. At the end of the testing, cheese H had an acidity of 1.04 per cent and cheese K only 0.72 per cent, and yet *B. typhosus* was surviving in both, while in 9 other cheeses in which typhoid bacilli could no longer be found, acidities ranged from 0.65 to 1.15 per cent. No difference was noted in the consistency of the cheese in which *B. typhosus* lived the longest and those in which *B. typhosus* was recovered for only a short period or not at all.

To determine what influence the addition of acid and the cultivation of certain organisms commonly found in milk have on the destruction of typhoid bacilli, the following experiments were undertaken.

Experiment I—January 5, 1926, 9 flasks of milk, each containing 800 c.c., were sterilized by steaming 1 hour on each of 3 successive days. Acidity of milk after sterilizing was 0.162 per cent. To each of 3 flasks enough chemically pure lactic acid was added to bring the acidity to 0.22, 0.58 and 0.99 per cent respectively. To 2 flasks pure culture of *S. lacticus* was added; 1 flask was kept at room temperature; and 1 in the icebox. To 2 other flasks a pure culture of a diplococcus isolated from pasteurized milk was added. (This diplococcus referred to hereafter as diplococcus X was an enzyme producer and had been causing sweet curdling of the milk in a large milk plant.) One flask was kept at room temperature and the other in the icebox. The remaining 2 flasks were used as controls. All 9 flasks were inoculated with *B. typhosus*, using for each flask 9 c.c. of an 18-hour broth culture. From time to time $\frac{1}{2}$ c.c. quantities from each flask were plated on brom cresol purple lactose agar, characteristic colonies fished and verified for *B. typhosus*.

The flask in which the acidity with lactic acid was 0.99 per cent curdled at once and *B. typhosus* was recovered on the 2d day, but not on the 3d day or later. From the flask in which the acidity with lactic

acid was 0.58 per cent *B. typhosus* was recovered for 37 days. In process of handling this flask became contaminated and the acidity increased until on the 24th day it was 0.83 per cent and remained unchanged until the 40th day, when the testing was discontinued. The flask in which the acidity with lactic acid was 0.22 per cent increased in acidity to 0.45 per cent by the 13th day and was 0.56 per cent on the 71st day. Tests were made at intervals of 4 or 5 days and *B. typhosus* was last recovered 84 days after inoculation. On the following day the acidity was 0.61 per cent.

The flask inoculated with *S. lacticus* and left at room temperature was curdled 4 days after inoculation but *B. typhosus* was isolated that day. The next test was made on the 7th day and no typhoid bacilli were found at that time or on three successive tests made at daily intervals. The acidity on the 8th day was 0.89 per cent. The corresponding flask in the icebox increased in acidity very slowly, reaching 0.40 per cent on the 105th day, and *B. typhosus* was recovered 163 days after inoculation, when testing was discontinued.

The flask inoculated with diplococcus *X* and left at room temperature increased in acidity slowly until it reached 0.60 per cent on the 30th day and then remained unchanged. *B. typhosus* was isolated 54 days after inoculation, but was not isolated on the 56th day or later. The corresponding flask kept in the icebox reached an acidity of 0.45 per cent on the 71st day after inoculation, at which time *B. typhosus* was isolated. Unfortunately, it was not tested again until the 105th day, at which time the acidity was 0.75 per cent and no typhoid bacilli were found.

The control flask inoculated with *B. typhosus* only, and left at room temperature, became infected during handling and the acidity gradually increased until the 34th day after inoculation, when it was 0.87 per cent. On that day *B. typhosus* was recovered, but on the following day and later no typhoid bacilli were found. In the similar flask kept in the icebox *B. typhosus* was isolated periodically for 163 days after inoculation, at which time tests were discontinued. On the 105th day the acidity was 0.52 per cent.

Experiment II—A similar set of tests was made on January 18, 1926. Milk was obtained from a certified dairy on January 13; 800 c.c. placed in each of 9 flasks and steamed 1 hour on each of 3 successive days. Three flasks were acidified with c.p. lactic acid to give final acidity of 0.53, 0.71 and 0.93 per cent respectively, instead of the weaker acid reactions used in the first experiment. Two flasks were inoculated with *S. lacticus* and two with diplococcus *X*. The remaining 2 flasks served as controls. One of each of the last 3 pairs

was kept in the icebox and the other at room temperature. The *S. lacticus* and the diplococcus *X* were grown in sterile milk and 10 c.c. inoculated into each of the respective flasks. To each of the 9 flasks was added 10 c.c. of an 18-hour broth culture of *B. typhosus*.

The flask of milk made 0.93 per cent acid with lactic acid was tested daily and *B. typhosus* was recovered after 2 days but not on the 3d day or later. The milk made 0.71 per cent acid with lactic acid continued to show typhoid bacilli for 8 days after inoculation, but no typhoid bacilli were found later. The acidity tested on the 6th and 10th days was 0.70 per cent. The milk acidified to 0.53 per cent with lactic acid remained at that acidity for 22 days. On the 25th day, the acidity had increased to 0.78 per cent and a growth of small acid producing colonies appeared on the plates in addition to the typhoid colonies. *B. typhosus* was last isolated 30 days after inoculation, but only 5 days after acidity was found to have reached 0.78 per cent, and at most 8 days after acidity rose above 0.53 per cent.

The milk inoculated with *S. lacticus* and left at room temperature increased rapidly in acidity, daily readings for the first 5 days being 0.45, 0.68, 0.77, 0.81 and 0.84 per cent respectively. *B. typhosus* was isolated daily for 5 days but not on the 6th day or later. The similar flask of milk kept in the icebox increased slowly in acidity, reaching 0.65 per cent 27 days after inoculation, at which time *B. typhosus* was last isolated. The flask of milk inoculated with diplococcus *X* and left at room temperature increased in acidity slowly at first, reaching 0.55 per cent on the 16th day. Then the acidity increased rapidly, to 1.04 per cent, 34 days after inoculation, at which time *B. typhosus* was recovered. On the following day and later no typhoid bacilli were found. The similar flask kept in the icebox increased gradually in acidity, reaching 0.62 per cent on the 60th day and 0.88 per cent on the 90th day. *B. typhosus* was isolated on the 86th day after inoculation, but not on the 92d day or later.

In the control flask inoculated with *B. typhosus* only and left at room temperature the organisms survived 129 days after inoculation and in the one in the icebox 151 days, when tests were discontinued.

Experiment III—Four flasks of milk, sterilized as in the previous experiment, were acidified January 25, 1926, with lactic acid to make the final readings 0.74, 0.78, 0.81 and 0.90 per cent acid, and then inoculated as before with *B. typhosus* and tested daily. *B. typhosus* was recovered after 1 day only from the milk made 0.90 per cent acid and after 4 days from each of the other 3 flasks.

It appears from these three experiments with milk that an acidity of about 0.70 per cent continued for a few days is deleterious to ty-

phoid bacilli, but in 1 flask of milk in the first experiment, *B. typhosus* survived an acidity of 0.80 per cent for 13 days and in the second experiment an acidity of 0.92 to 1.04 per cent for 7 days. In the first case an acid producing organism was growing in the milk and in the second case an enzyme producer had been cultivated along with the typhoid bacilli.

From these tests it seemed probable that the type of bacteria growing in milk or cheese had an influence on the length of life of *B. typhosus*, either through some undetermined chemical change or through the kind of acid produced. Since it was not practicable to test the various flasks of milk and the cheeses for all the acids present, it was decided to test the longevity of *B. typhosus* in the presence of the different acids commonly found in cheese—lactic, butyric, acetic, propionic, and caproic. For this test 16 flasks were prepared each containing 600 c.c. sugar free broth pH 7.2. It was planned to use 1 flask for control and 3 flasks for each acid, sufficient acid to be added to make acidity titrated with *N*/10 NaOH read 0.70, 0.85 and 1.00 per cent, respectively. The available supply of propionic and caproic acids was insufficient to procure quite the concentration of acidity desired. After the reactions were adjusted *B. typhosus* was added, using 8 c.c. of an 18-hour broth culture for each flask. Plates and subcultures were made daily until at least two consecutive sterile tests were obtained. The actual titrations and results are given in Table II.

These tests show a striking difference in the effect of different acids and indicate that caproic acid is much the most detrimental to *B. typhosus*, as this organism does not survive a concentration of 0.70 per cent for 1 day, whereas it survives acetic acid in a concentration of 0.73 per cent for 4 days and of 1.00 per cent for 1 day.

The shorter life of the typhoid bacilli in broth to which lactic acid is added, than in milk with the same percentage of lactic acid, is probably due to the combination of some of the lactic acid with the casein, there being left only a portion of the total acid free to act upon the organisms, as pointed out by Zae Northup³ in a study of the influence of the products of lactic acid on *B. typhosus*.

In order to determine the effect of diminution of free access of air on the life of *B. typhosus* in cheese, the following experiment was undertaken:

On April 1, 1926, cheeses L, M and N, which had been made February 23, 24 and 25, respectively, and from which *B. typhosus* no longer could be recovered, were ground in mortars. To 50 gm. of each cheese was added 10 c.c. broth culture *B. typhosus*, and the whole emulsified. Instead of putting in presses, these samples were left at

TABLE II

COMPARATIVE BACTERICIDAL EFFECT OF VARIOUS ACIDS ON *B. typhosus*

No. Days	lactic 0.713%	butyric 0.705%	acetic 0.73%	propionic 0.716%	caproic 0.70%
1	+	+	+	+	—
2	—	+	+	+	—
3	—	—	+	+	—
4		—	+	—	
5			—	—	
6			—	—	
No. Days	lactic 0.849%	butyric 0.856%	acetic 0.875%	propionic 0.80%	caproic 0.80%
1	—	—	+	+	—
2	—	—	+	+	—
3	—		—	+	
4			—	—	
5				—	
No. Days	lactic 1.01%	butyric 1.02%	acetic 1.00%	propionic 0.94%	caproic 0.86%
1	—	—	+	+	—
2	—	—	—	—	—
3	—		—	—	

room temperature in tumblers, covered with glass Petri plates and tested daily for *B. typhosus*. The samples, of course, became very mouldy but *B. typhosus* was isolated for 16 days from one sample and for 13 days from each of the others. The acidities of the cheeses before emulsifying were 1.15, 1.19 and 1.04 per cent, respectively. Table III shows the changes in acidity and the bacteriological findings on the daily tests.

The remainder of cheeses L, M and N was mixed and emulsified with *B. typhosus* broth culture, using 450 gm. of cheese and 100 c.c.

TABLE III

LONGEVITY OF *B. typhosus* IN INOCULATED CHEESE WITH AND WITHOUT ACCESS OF AIR

No. Days	Exposed to Air						Air Excluded	
	Cheese L		Cheese M		Cheese N		Cheeses L M N after Pressing	
	% acid	<i>B. typhosus</i>	% acid	<i>B. typhosus</i>	% acid	<i>B. typhosus</i>	% acid	<i>B. typhosus</i>
1		+		+		+		+
2	0.83	+	0.72	+	0.69	+		+
3		+		+		+	0.98	+
4		+		+		+		+
5	0.90	+	0.72	+	0.76	+		+
6		+		+		+		+
7		+		+		+		+
8		+		+		+		—
9	1.12	+	0.94	+	0.97	+		—
10		+		+		+		—
11		+		+		+		
12		+		+		+		
13		+		+		+		
14		+		—		—		
15		+		—		—		
16		+		—		—		
17		—						
18		—						
19		—						

of culture. This emulsion was then packed in the cheese press, at which time the acidity was 0.97 per cent, and when removed from press the following morning the cheese mixture was dipped in paraffine. Samples were taken daily by means of a cork borer. *B. typhosus* was recovered for 7 days only. At the beginning of the tests the acidity of the mixture was higher for some unexplained reason than that of the individual samples, and the shorter length of life of *B. typhosus* may have been due to the acidity rather than to the partial exclusion of air. However, the sample of cheese L emulsified and left in the tumbler developed an acidity of 1.12 per cent by the 9th day and *B. typhosus* lived for 6 days thereafter, whereas the acidity of the mixture of the three cheeses at no time exceeded 0.98 per cent. The variation in the type of bacteria multiplying under the two conditions may also have had an influence on the survival of the typhoid bacilli.

This investigation has raised many questions that need further study, both from a chemical and from a bacteriological point of view.

SUMMARY AND CONCLUSIONS

1. Reference is made to an epidemic of typhoid fever traced to Cheddar cheese made at a factory, one of whose contributing patrons was proved to be a typhoid carrier.

2. The cheese in question had been made from milk which would not curdle satisfactorily. This would indicate an unusual bacterial flora resulting in a changed chemical condition.

3. The development of cases in the epidemic indicates that *B. typhosus* lived in the cheese approximately 63 days.

4. Eighteen experimental lots of cheese made from milk infected with *B. typhosus* contained the organisms on the day of manufacture.

5. The experimental data indicate that usually, in the ordinary course of ripening, *B. typhosus* cannot be recovered from Cheddar cheese after the 8th day. However, 2 of the 18 cheeses harbored *B. typhosus* for 34 and 36 days, respectively.

6. Since the two cheeses in which *B. typhosus* lived 34 and 36 days, respectively, were made from the same lot of milk, it is probable that the longevity of *B. typhosus* in Cheddar cheese is influenced by the bacterial flora of the milk. Two instances in the milk experiments gave comparable results and seem to substantiate the same probability.

7. The experimental data indicate that the degree of acidity and the character of the acid present are important factors in the destruction of *B. typhosus* in cheese. However, a specific acidity will not uniformly result in the destruction of this organism in cheese. This is probably because different acids do not affect the organism to the same degree and also because the bacterial flora of the milk and the complex chemical constituents of cheese may counteract the effect of the acidity differently in different lots of cheese.

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Geographic Distribution of Deaths from Diphtheria*

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AN attempt has been made to study the geographic distribution of diphtheria deaths during the last two years (1926 and 1927) based primarily upon records of the industrial policy holders of the Metropolitan Life Insurance Company. During 1927 there was an increased prevalence of diphtheria which, except for limited areas, appeared to spread quite generally over the United States and Canada. The extent of this increase, so far as the Metropolitan experience is concerned, is indicated in Table I.

TABLE I

DEATH RATES PER 100,000 FROM DIPHTHERIA. METROPOLITAN INDUSTRIAL POLICY HOLDERS
AND U. S. REGISTRATION STATES, AS OF 1910. TOTAL PERSONS, ALL AGES

Year	Metropolitan	U. S. Reg. States, as of 1910	Year	Metropolitan	U. S. Reg. States, as of 1910
1927	10.6	*	1918	19.3	14.7
1926	9.7	7.4	1917	24.6	16.5
1925	10.6	7.9	1916	21.0	13.9
1924	13.1	10.4	1915	21.4	14.5
1923	15.5	12.9	1914	25.7	17.2
1922	18.0	14.4	1913	27.2	18.2
1921	23.8	17.7	1912	24.5	16.9
1920	22.1	15.9	1911	27.3	17.9
1919	20.9	15.9			

* Not yet available.

It will be observed in the Metropolitan experience that the consistent decline year by year since 1921 from the high point of 23.8 was broken in 1927, when the rate of 9.7 for 1926 was succeeded by an increase to 10.6 per 100,000. This table also indicates the diphtheria rates from 1911 to 1926 for the U. S. Registration States, the 1927 figures not being, as yet, available. In all probability, however,

* Read before the Vital Statistics Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 19, 1928.

the 1927 rate will show a material increase for the registration states over 1926. We have, in fact, an estimate made by the Surgeon-General of the U. S. Public Health Service, reported to us by the Health Department of Virginia, in which preliminary reports for 1927 for the U. S. Registration Area indicate an increase in diphtheria deaths of approximately 17 per cent over 1926.

Another indication of the increase in diphtheria in 1927 is to be found in the American Medical Association report on diphtheria mortality.¹ Table II presents certain figures from this report:

TABLE II

DIPHTHERIA DEATH RATES PER 100,000 POPULATION IN CERTAIN STATES AND IN URBAN AREAS BY GEOGRAPHICAL DIVISIONS, 1926 AND 1927

	1927	1926
Colorado.....	9.1	9.2
Maine.....	+ 3.8	2.5
Maryland.....	+ 7.4	6.2
Massachusetts.....	+ 6.3	5.9
Minnesota.....	3.0	5.9
Montana.....	+ 2.8	2.6
New York.....	+ 8.6	6.4
Pennsylvania.....	+ 8.5	8.3
Wyoming.....	4.6	5.5
Cities in:*		
New England.....	+ 8.8	6.8
Middle Atlantic.....	+ 11.8	9.2
South Atlantic.....	+ 7.5	6.4
East North Central.....	+ 13.3	12.8
East South Central.....	+ 7.6	6.8
West North Central.....	5.6	10.0
West South Central.....	+ 11.2	7.8
Mountain and Pacific.....	5.9	7.2

* Cities of 100,000 population and over

It will be noted that for the 9 states for which figures were available at that time, all but 3 showed varying but, for the most part, small increases in rates. The 3 showing decreases (Colorado, Minnesota, and Wyoming) are all western or northwestern states. For the cities over 100,000 population, grouped by geographic grand divisions, there are increases recorded except in the Mountain and Pacific Group and the West North Central Group (cities in Minnesota, Iowa, Nebraska, Kansas and Missouri).

Ordinarily, such a small rise in the mortality from *any* disease would be in nowise disconcerting. But, in the case of diphtheria, it may be of decided importance for the following reason: For each of the 5 years immediately preceding 1927, a new minimal diphtheria death rate was in evidence. During this continuous decline the diph-

theria mortality rate among Metropolitan industrial policy holders dropped 60 per cent, and in the registration area 58 per cent. This continuous decrease is considered one of the outstanding public health accomplishments of the current decade. It was naturally expected to continue as the period was contemporaneous with an increasingly intensified campaign for immunization of children against diphtheria—and, to our knowledge, there was no relaxation in that campaign during 1927. We regard even this small increase in the diphtheria death rate as an important point of inquiry for the public health workers of America, to determine where the increase has occurred, and more particularly, the relative relationship of those localities where immunization campaigns have been especially active and persistent.

A more detailed analysis of the Metropolitan experience, based on total mortality figures, and not rates, discloses the following facts: In 1926 in this group of more than 18,000,000 industrial policy holders, there were 1,689 deaths from diphtheria; in 1927 there were 1,884 deaths—an increase of 195 deaths, or 11 per cent. This increase is materially in excess of the increase in numbers of policy holders, as demonstrated by the rate increase in Table I.

For business, administrative, and statistical purposes, the Metropolitan field work is organized on a territorial basis. When the diphtheria experience for these 2 years is analyzed according to territories, it is found that certain territories (5 in number) have more or less marked increases, while others, not listed below, remain practically stationary, and 2 territories show decreases. The striking increases are as follows:

	Increase
Metropolitan Territory (including Greater New York and Westchester County)	193 to 256
Middle West Territory (Illinois and Indiana)	149 to 185
Keystone Territory (Pennsylvania)	151 to 172
Atlantic Coast Territory (Delaware, District of Columbia, Maryland, New Jersey and Virginia)	123 to 196
Canadian Territory (8 Provinces including Quebec)	185 to 259

The 2 territories showing decreases are as follows:

	Decrease
Northwestern Territory (Iowa, Michigan, Minnesota, Nebraska and Wisconsin)	218 to 153
Pacific Coast Territory (California, Colorado, Idaho, Montana, Oregon, Utah and Washington)	136 to 104

A further analysis of certain of these increases, particularly in the Metropolitan and Middle West Territories, discloses data of interest. The Middle West, increasing from 149 to 185, is made up of 2 states, 1 of which, Indiana, showed a decrease from 32 to 22, while Illinois jumped from 117 to 163. Further analysis indicates that this in-

crease was entirely confined to Chicago. The number of deaths in Chicago in 1927 increased over 1926 from 84 to 136—an increase of 52, or 62 per cent. In the rest of the state there was actually a decrease from 33 to 27 or an improvement of 18 per cent.

If a parallel contrast is drawn between the Metropolitan Territory (New York City and environs) and New York State, comparable and similar observations result. In the Metropolitan Territory the increase was from 193 to 256, an increase of 63, or 33 per cent. In New York State, exclusive of New York City, the increase was from 60 to 63—3 deaths, or 5 per cent. The increase for the state and city combined was 26 per cent.

From this analysis it would appear that in these 2 territories, showing marked increases, the augmented diphtheria mortality was an urban affair. As a matter of fact, combining the increase for New York City and Chicago gives a total of 115 deaths, or 59 per cent of the total increase in the Metropolitan experience. Still further contrasting this urban and rural picture, the combined mortality for the 4 cities showing the highest increases in the Metropolitan experience (New York, Chicago, Pittsburgh and Montreal), approximates 88 per cent of the total increase (172 deaths).

It seems probable that a further analysis of the registration area figures, when they are available, will support this rural-urban contrast. This is borne out by such information as is now obtainable. Data for both cases and deaths for 1926 and 1927, for the general population of New York City and for the rest of the state, are given in Table III.

TABLE III

DIPHTHERIA CASES AND DEATHS, 1926 AND 1927—NEW YORK CITY AND REST OF NEW YORK STATE

	1926	1927	Increase	Per Cent Increase
City { Cases	7,800	13,507	5,707	73.2
{ Deaths	477	717	240	50.3
Rest of State { Cases	3,628	3,914	286	7.9
{ Deaths	251	265	14	5.6

From this it will be observed that in the city cases increased 73.2 per cent, whereas in the rest of the state the increase was only 7.9 per cent. Deaths increased 50.3 per cent, whereas upstate the increase was but 5.6 per cent.

Data furnished by Dr. Rawlings of Illinois, contrasting Chicago with the rest of the state, bring out the same picture:

TABLE IV

DIPHTHERIA CASES AND DEATHS, 1926 AND 1927—CHICAGO AND REST OF ILLINOIS

	1926	1927	Increase	Per Cent Increase
Chicago { Cases	2,551	4,124	1,573	61.6
{ Deaths	224	442	218	97.3
Rest of State { Cases	1,978	2,148	170	8.6
{ Deaths	186	205	19	10.2

It is noted that in Chicago cases increased 61.6 per cent, whereas in the rest of the state the increase was but 8.6. Deaths increased 97.3 per cent, whereas in the rest of the state the increase was but 10.2.

A further glance at the Company territorial decreases discloses the fact that in the Pacific Coast Territory the decrease was more or less general throughout the states and sub-divisions. This corresponds with the experience of the general population as indicated in the data presented in Table II. As shown in that table, the only states showing decreases and the only groups of cities showing decreases, except those in the West North Central section, are Mountain or Pacific states and cities.

The other territory showing a decrease was the Northwestern Territory. When this decrease is analyzed by states, the only striking contrast is that of Michigan where the decrease was from 149 to 99. If the experience of this state is further analyzed, it is found that an essential part of this decrease was in Detroit (from 108 to 79, or 29 per cent). This decrease represents 58 per cent of the total state decrease and 45 per cent of the total decrease for the entire Northwestern Territory.

Is it possible to hazard any surmises as to the etiological factors in this picture? We of course do not know how many or what factors may have been responsible for the increased mortality that affected large portions of the country, and that obviously were especially manifest in the very large centers of population. Why did the outbreak of 1927 apparently especially affect the large cities? Why was it essentially, so far as our records go, an urban affair? Does this condition reflect, probably among other influences, contrasts in relative percentages of immunity on the part of the childhood population? It must be remembered that the areas referred to as "rural" are so only by contrast to the great metropolitan areas. They contain, of course, small towns and cities.

There would seem to be some evidence to indicate that the prob-

able percentages of population immune as a result of the relative effectiveness of recent efforts at immunization, may be a factor in these contrasts. Taking New York State and City, for instance, it is a well-known fact that during the last 2 years at least, immunization with toxin-antitoxin has been more extensive upstate than in the city. In New York City the Health Department figures indicate a total of 30,024 children immunized by the department in 1926, and approximately 82,000 immunized in 1927. Of course, it is recognized that many of those immunized in 1927 would not have developed their immunity sufficiently early to combat the epidemic of that year. Nevertheless, the total of 112,024 immunized in the 2 years indicates the volume of work done. This can be measured against a general estimated population of 5,970,000. It does not, of course, include immunizations by private physicians.

In contrast, in the upstate area, the Health Department has a record of 118,220 children immunized in 1926 and 211,013 in 1927, or a total of 329,233 against an estimated population of 5,495,000. It is generally conceded that during the last two or three years in the upstate area, more immunization work has been done; a larger percentage of preschool children has been reached; and more work in particular has been carried out in the small town and semi-rural areas. The evidence would be more convincing if there were available reliable estimates as to the actual percentage of the childhood population now immune in these 2 areas.

Figures for Chicago and the rest of Illinois apparently indicate the same tentative conclusions. The State Department of Health *Monthly Bulletin* for May may be quoted as follows:

Leaving Cook County out of consideration, Illinois experienced its lowest loss from diphtheria last year. Forty-four counties escaped without a single death from this cause and the loss suffered by the others amounted to 150 fatalities compared with 160 in 1926. This amounted to a 6 per cent decline in the number of deaths, and gave a rate of 3.9 per 100,000 population. In 1926 the rate was 4.3 for the state outside Cook.

Including Cook County the state suffered an increase of 57 per cent in mortality from diphtheria during 1927. There were 30 counties in which increases were observed but the rise of 98 per cent in Cook County was by far the most important factor in making the state average greater. . . .

While no very accurate analysis of the data has been made it appears certain that the use of toxin-antitoxin has been promoted on a much larger scale in the northern and southern counties than in the central section of the state. Work in the southern territory has been particularly noticeable, and apparently it has appealed to the public there in a more practical way than elsewhere. In a number of communities toxin-antitoxin has been given to practically the whole susceptible population. Doubtless this has been an important factor in the favorable experience with diphtheria.

We previously pointed out that the decrease in the Northwestern Territory, and particularly in Michigan, was to be accounted for largely by the decrease in Detroit. While definite statistical conclusions cannot be drawn from the experience there, the general impression of health authorities in that city would seem to reflect the foregoing observations as to the apparent relative protection resulting from a notable if not unique urban immunization effort in that city.

A report furnished by Dr. Buck of the Detroit Health Department indicates that during 1926 and 1927, 144,691 children were immunized, which brings the total immunized in that city since 1921 up to 181,294, measured against an estimated population in 1927 of

TABLE V
DIPHTHERIA—NEW YORK STATE EXCLUSIVE OF NEW YORK CITY

	Per 100,000 Population		Per 100 Cases
	Case	Death	Fatality
1920.....	190	18.8	9.9
1921.....	250	17.0	6.8
1922.....	161	12.4	7.7
1923.....	111	8.8	7.9
1924.....	127	8.2	6.4
1925.....	92	7.2	7.8
1926.....	69	4.7	6.8
1927.....	78	4.9	6.3
1928.....	63	5.0	7.8

1,334,500. Even when corrections are made for overlappings and graduations from one age group to another, it is estimated that the percentage of children under 11 years now immunized in Detroit is approximately 57—the highest recorded percentage for any large city, so far as we know.

Another state which has a rather unusual record in immunization work within the last 2 years is Virginia. During the latter part of 1926 and early part of 1927, 200,000 children were immunized in Virginia at clinics organized by the State Department of Health. The department estimates that at least 40 per cent of the childhood population of Virginia has been protected, and believes that this has had a very determining influence in effecting a decline of 20 per cent in the death rate, and 38 per cent in the case rate from diphtheria during the last year.

The foregoing observations on New York, Illinois, Detroit and Virginia, while not conclusive, are nevertheless decidedly encouraging

in reflecting, as they apparently do, the protection which relatively extensive immunization gave the childhood population against a practically nation-wide increase in the disease.

The only records we have immediately available for 1928 are the Metropolitan industrial policy holders' figures and the records for up-state New York. So far as the Metropolitan experience is concerned, the wave of diphtheria characterizing 1927 seems to a degree to have persisted during the first half of 1928. On September 22, however, the cumulative rate for 1927 was 9.2 per 100,000, whereas on the same date in 1928 it was a fraction below the 1927 figure. The tendency has been in the direction of a lower rate and it is hoped that the 1928 figure may fall still further below the 1927 record.

In New York State, exclusive of the City, the number of cases reported in 1928 was slightly below the 1927 figure for the first half of the year. The fatality rate is, however, somewhat higher, making the death rate approximately the same. Figures from 1920 to 1928 inclusive, comparing the first half of these years, are given in Table V, as prepared by the New York State Department of Health.

What is needed in the campaign for diphtheria prevention is a more intensive and effective effort to immunize a large percentage of the childhood population, to reach a relatively much greater percentage of preschool children, and to carry out the program at least as effectively and extensively in the great centers of population as has been demonstrated to be feasible in the smaller population areas. Furthermore, the 1927 experience, as implied previously, seems to constitute a problem worthy of further study and analysis by interested health agencies.

REFERENCE

1. Diphtheria Mortality in Large Cities of the United States in 1927. Fifth Annual Report. *J. A. M. A.*, May 19, 1928, p. 1621.

The Industrial Viewpoint of the Phenol Waste Disposal Problem*

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MY first experience with phenol contaminated waste waters polluting the streams dates back to 1906 when we had a complaint from the New Castle, Pa., Water Works, located on the Shenango River about 20 miles south of Farrell, Pa.

We had 212 by-product coke ovens at Farrell which began operating in 1903 and were dismantled in 1923. We made no effort to treat the phenol water from this plant for the first three years of operation. The taste in the river water was pronounced only occasionally, usually in the winter after ice had covered the river and prevented oxidation.

After extended investigations it was concluded that this water could not be treated commercially with sufficient assurance of removing all the taste producing acids, so that it would be clean enough to put into the river. Very accurate records were kept on the taste of the water supply of New Castle, as the taste was occurring too frequently.

In 1906, Dr. Unger, of the Research Bureau, of the Carnegie Steel Company, came to Farrell and conducted a series of tests but could not find any practical solution for our trouble. It was then that I suggested the use of this contaminated water for quenching our coke and for the building of a return quenching system. Only about 20 per cent of the water which is put upon the hot coke is evaporated and the rest runs off the coke as hot contaminated water; so we had to construct large sumps to keep this return contaminated water from entering the sewer. This opened up another problem, for this returned waste water was polluted with fine coke dust. In order to get a maximum settling we were obliged to construct large settling basins; but even with these we found that a considerable amount of fine coke dust was carried along into our circulating pumps and cut out our impellers so rapidly that we were forced to re-design our centrifugal pumps to reduce this excessive abrasion of the impellers. We also discovered that the rapid circulating of the returned quenching water heated the water to almost a boiling temperature, so that we lost the

* Read before the Public Health Engineering Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 18, 1928.

suction of our pumps, necessitating the lowering of these circulating pumps to a level assuring us a constant suction head of at least 5 feet.

The rapid accumulation of coke dust in our sumps necessitated the development of a means for removing this dust without stopping the quenching operation. We found that the best way to clean out these sumps was by the use of a locomotive crane and clam shell bucket which lifted out the dust without emptying the water from the sump.

These sumps were subsequently designed with a capacity sufficiently large to allow at least a carload of coke dust in the settling compartments and of such dimensions that a locomotive crane operation could be efficiently used.

We also found that in order to have a uniform quality of quenching water it was necessary to have all of our contaminated waste waters led to one central mixing tank and any make-up fresh water that was required would be added to this central mixing tank. This latter development was applicable to a larger sized plant, such as we now have at Clairton, Pa., where there are 10 quenching stations. The Clairton By-Product Coke Plant has a daily coking capacity of 30,000 net tons of coal per day.

The Clairton plant is located several miles above the McKeesport City water intake, and it was imperative that this river water, because it had practically no opportunity of purifying itself by stream oxidation, be free from phenol pollution.

Thus having worked out the mechanical arrangement to handle this contaminated waste water, with a closed quenching system at each quenching station, we were certain that we could evaporate all of our contaminated waste waters by the quenching of the hot coke. It was discovered, however, that the phenol in the waste waters was not so much the cause of any great trouble around our plant, but because of the large amount of chlorine on our coal, our ammonia still waste waters were heavily charged with calcium chloride, which was formed in our ammonia stills by the use of milk of lime to free the ammonia from the ammonium chloride. It is this calcium chloride, which builds up to 2½ per cent in the quenching waters, that has given us the greatest amount of trouble, due to its corrosive nature.

The quenching machines, rails and steel work around the batteries, and in fact all over the plant, are subjected to an abnormal rusting action, for the steam generated in the quenching operation carries a considerable amount of calcium chloride mechanically, and sprays the corrosive vapor over wide areas.

While we have solved the problem of the disposal of this taste producing contaminated waste water, as far as preventing its dis-

charge into the stream, it has not been in a manner that will eliminate a source of great expense and plant atmospheric nuisance.

We find a very pronounced odor to the coke quenched by this contaminated water, and while this odor does not affect the use of this coke for metallurgical purposes, it does interfere to some extent with its sale for domestic use, and the calcium chloride, being hygroscopic, makes it difficult to secure the low moistures in the coke secured by fresh water quenching. The excessive corrosion from the quenching with the calcium chloride water may be caused by the formation of some free hydrochloric acid.

For a good many years, we have been working on the problem of economic recovery of the phenols from the ammonia still waste, and recently considerable progress has been made; in fact, some plants have secured an efficiency of 90 to 95 per cent removal, and with this degree of refinement it is possible to discharge treated effluent into the streams at such a dilution that no taste trouble will occur.

The large percentage of by-product coke plants of this country are built with direct system of ammonia recovery. By this means the average coals will produce 20 gallons of ammonia still waste per ton of coal coked. This water comes from the free and fixed water in the coal. Plants using washed coal with a free water content of 8 per cent and 5 per cent fixed water will have about 28 gallons of ammonia still waste per ton of coal; while plants using the indirect system of ammonia recovery will have about 90 gallons per net ton.

Since the evaporation by hot coke quenching requires 70 to 80 gallons of water per net ton of coal coked, it is apparent that by the use of the indirect system of ammonia recovery we will produce about 10 per cent more still waste from this source alone than can be evaporated by the coke produced. But in the direct ammonia recovery system, such as we have at Clairton and in about 80 per cent of the by-product coking capacity of this country, it is possible not only to evaporate all of the still waste produced, but an additional amount of 60 gallons per net ton of coal coked; so that we are able to take all of the benzol plant contaminated waste water, in addition to all of the final direct cooler water, as well as all of the ammonia still waste.

Table I shows the amount of contaminated waste water coming from the three principal sources of a by-product coke plant of the direct ammonia recovery system and complete benzol recovery and refining operations; also the analysis of the contaminated water from each of these three sources.

From these figures it is apparent that a coke plant produces some contaminated waters which are practically free from phenols, such as

TABLE I

CONTAMINATED WATER DISPOSED OF DAILY BY CLAIRTON BY-PRODUCT COKE PLANT
Capacity of Plant 30,000 N. T. Coal per 24 Hours

Contaminated Water	Gals. Per Day	Gals. per Net Ton Coal	Contamination	Method of Disposal	Remark
Still Waste	600,000	20	Phenols, Cyanides, Tar and CaCl_2	All used for coke quenching	No connection to sewer
Benzol Sump	300,000	10	Benzol, Wash Oil and Naphtha	Recirculated	"
Final Cooler	1,500,000	50	Phenols, Cyanides, Tar and Naphtha	Recirculated and excess used for quenching	"

Total water evaporated—2,400,000 gallons

ANALYSIS OF CONTAMINATED WATER

Still Waste		Benzol Sump Water		Final Cooler Water	
	GPL		GPL		GPL
Phenols	2.00	Benzol	2.00	Phenols	0.28
Cyanides	0.50	Wash Oil	4.00	Cyanides	0.10
Tar Oils	1.00	Naphthalene	0.50	Tar Oils	0.30
Calcium Chloride	16.00			Naphthalene	1.00

the 10 gallons per ton of coal coming from the benzol plant; these waters are contaminated with benzol, wash oil and naphthalene, so that in either case, whether the phenols are extracted or not, the remaining source of taste producing contaminated waters may be objectionable for discharge into the streams and should be evaporated by hot coke quenching in a closed quenching system.

I might mention that the Clairton By-Product Coke Plant is not only the largest plant of its kind in the world, but it is operating on 100 per cent high volatile Pittsburgh coals, containing a high percentage of tar and very high chlorine content. Our frequent checking system by sampling indirect condenser water for tastes enables us to discover the slightest leaks from our condensers; permitting us to operate this large by-product plant full capacity for the past 10 years, without discharging any phenolated waste waters into the stream.

Some day it may develop to be a profitable operation to extract the phenols from the ammonia liquor so that this liquor free from phenols can be put into the streams. In this event, a very large amount of corrosion coming from the calcium chloride could be eliminated, as the calcium chloride free from phenols may be disposed of in the streams. The remaining source of phenol and benzol contaminated water could continue to be used as quenching water, and evaporated.

NOTE: W. L. Stevenson, Chief Engineer of the Sanitary Water Board of the Health Department of the State of Pennsylvania, has given untiring effort and coöperation, and the Carnegie Steel Company officials, as well as all of those associated in the Clairton operation, have spared no expense in their efforts to obtain a satisfactory solution of this most perplexing problem in the by-product coking operations.

Common Interest Problems of State Directors of Public Health Nursing*

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IN Indiana we try to serve all groups of public health nurses, those employed by unofficial as well as by official health agencies. This means that school nurses, tuberculosis nurses, city health department nurses, bedside or visiting nurses, and industrial nurses come under our observation. The only other advisory nurses in the state are a nursing field representative employed by the American Red Cross and two district advisory nurses, one employed by the Metropolitan Life Insurance Company and the other by the John Hancock Life Insurance Company.

In our relation to these groups of nurses, the most important problems confronting state directors are:

1. To get the right nurse in the right position. Placement work is one of the most important tasks of a director. It enables her to insure the right standards of public health nursing in a service from the beginning.

2. To maintain good nursing technic. Since the nurse is a teacher, and her every nursing procedure is usually carefully observed by imitative children or adults, she cannot afford to be lax on this score, even though the fundamental principles of asepsis were not involved.

3. To make sure that the nurse's visit shall be packed with sound education. For instance, advocating more home calls to a school nurse means nothing if she only steps to the door and tells a mother that her son's tooth is decayed and then departs. There is a scientific plan for the essential content of a home nursing visit which the nurse must understand thoroughly.

4. To see that the nurse knows how to form her program in a systematic manner to meet the needs of her community, instead of proceeding each day without any preconceived plan.

5. To make sure that the nurse closely adheres to her medical ethics. There is no type of nursing which taxes a nurse's knowledge of medical ethics and judgment in practicing it, as does public health nursing, where in the daily round of her duties she comes in contact with the patients of not only every physician in the community but of every quack as well.

6. To see that a nurse knows how to mobilize and utilize voluntary assistance, that great storehouse of energy and means of wider activity and publicity for her and her work, if rightly used and directed.

* Read before the Public Health Nursing Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 15, 1928.

7. To see that the nurse understands how to coöperate with other agencies in the community or state which can assist her in furthering her work.

Pearl McIver, director of the Missouri State Department of Public Health Nursing, while at Teachers' College, Columbia University, New York, N. Y., last year, made a study of staff education for rural public health nurses in twelve selected states. She gives six methods of attacking the staff education problems which were used by the directors in these twelve states. These methods can well apply to all types of public health nursing services; so they are enumerated here with an explanation of the way in which each one is used to solve our staff education problems in Indiana.

PERSONAL CONTACTS AT THE STATE OFFICE AND IN THE FIELD

We always encourage new nurses to visit the state office either before taking positions or shortly after, and we explain the resources of the state in health work. They are given an opportunity to talk with the heads of departments of the State Board of Health and our health commissioner himself.

The new nurse visits the university hospitals, with which she has many contacts in the course of her work. She meets the executive secretary of the state tuberculosis association or the Red Cross nursing field representative. We aim to leave nothing undone which will make the nurse appreciate the interest we and the other state agencies feel in her and her work.

Regarding personal contacts in the field, our hope has been to visit each public health nursing service at least twice a year, but with so many services and some of them needing more assistance than others, it has never been possible to get around to them all even once in any year. We try to visit the new nurses early, spending from three days to a week with them.

Since Indiana has so many joint public health nursing services and the American Red Cross has a nursing field representative in the state who sends us reports of her visits to every service and confers with us about them, we agree to have her make the field visits on all services in which the Red Cross participates, leaving us freer to spend more time in the other services.

Tuberculosis association funds are used in more of the county services even than Red Cross funds, and since the state tuberculosis association employs no advisory nurse, our department serves them in that capacity. We consult with the state tuberculosis association executive when we visit any service where tuberculosis association funds are used, and report any developments of interest to his department. Since our department is the connecting link in state

supervision of public health nursing between the Red Cross and the state tuberculosis association, we also report to him anything of interest concerning a tuberculosis service given on the report of the Red Cross nursing field representative, and report to the Red Cross Headquarters in Washington on any service to which the Red Cross is contributing, sending a copy of our letter to the state Red Cross nursing field representative.

Concerning contacts in the field, we sometimes find that spending an evening with a nurse does much more toward creating confidence and good feeling than does contact during hours on duty.

CONTACT BY CORRESPONDENCE AND BULLETINS

The second method of attacking the problems of staff education is by contact with the nurses in the field through correspondence and bulletins.

We believe thoroughly in publicity in public health nursing through our special bulletin, *Echoes*, and through the State Board of Health *Bulletin* to which we contribute. In our State Board of Health *Bulletin* we announce new placements made by our department with a description of the nurses' training and experience, and also mention the nurses who are taking special courses in public health nursing. We believe that these bulletins are giving all the public health nurses in the state a greater group feeling.

REGIONAL CONFERENCES

We have only made a small start, but the experiments so far lead us to believe that the regional conferences can be the very best means of teaching the nurses better ways of doing things, because requests for these meetings come from the nurses themselves.

We have divided the state into five public health nursing districts, the size determined not only by the number of public health nurses in them but by the types of services which they contain. We believe the city staff nurses and the county and town nurses need to get together.

There will probably be a fundamental program arranged for each district, based on the general need of all the nurses and including demonstrations of nursing procedures, but there will be a certain latitude for choice of topics by the nurses themselves which they indicate in the questionnaires sent to them.

ENCOURAGING ATTENDANCE AT STATE AND NATIONAL MEETINGS

We attend the annual meeting of the state tuberculosis association and the Indiana State Conference on Social Work and urge the nurses to attend them, not only for the parts of the program which touch

directly upon nursing, but for the larger vision obtainable of organization possibilities and individual and family case work.

At the annual meeting of our State Nurses' Association a day is given over to a public health nursing program. Our department is always consulted about the program and we coöperate by obtaining speakers and planning special round tables and exhibits for the nurses.

Each year more nurses attend the annual conference of our state health officers. We suggest to our State Health Commissioner for inclusion in the program the names of one or two nurses who are doing outstanding work. The health officers need this contact with the nurses and the nurses need the health officers' point of view.

A loan library which contains the standard and latest health publications is another factor that can be used in promoting staff education in a state. A small one has been started in our state library, and the nurses can either obtain the books from the state directly or through their local libraries.

POSTGRADUATE STUDY FOR NURSES

This can be done in five different ways:

1. By providing scholarships. Since the Indiana State Board of Health does not contribute to the salary of any public health nurse, as some state departments do, we have no funds for scholarships. We always explain to would-be public health nurses the American Red Cross public health nursing scholarships.

2. By maintaining a rural teaching center. This method has never been attempted in Indiana because the state is so situated that the nurses desiring to do county work can easily take public health nursing courses at nearby colleges or get experience on public health nursing staffs in Indiana cities.

3. By offering extension courses. Our department could do a great deal toward presenting the opportunity for extension work to the nurses, and we mean to be more active in this than we have been.

4. By arranging short intensive courses in various specialties. The National Tuberculosis Association and the American Red Cross have held institutes in the state, and we have attended and encouraged the nurses to attend.

5. By arranging for leaves of absence. Many times our department has been instrumental in having a health officer, a superintendent of schools, or a health committee see the advantage of allowing a nurse a leave of absence to visit some good public health nursing service for a week or more for observation; or taking a summer course, or even a year's course, in public health nursing.

The first requisite for developing an effective staff education program is coöperation with other state and national health agencies. We state directors are always preaching coöperation to the nurses out in the field, and I wonder whether we ourselves are coöperating to the fullest extent with other health agencies. A director should not think she is the only authority on public health nursing in her state. Many of our state public health nursing departments would not be in

existence if they had not originally been fostered and financed by two of the unofficial health agencies, the American Red Cross and the state tuberculosis associations. These two organizations, because they are national in scope, are kept from becoming too provincial. They are both doing valuable health work in Indiana and without them and the stimulus they give to lay groups and to us, public health nursing in many communities would be far behind or not even started.

Since so many public health nursing services are financed by combinations of the Red Cross, the county tuberculosis association, the health departments, and school boards, there would be a tremendous amount of confusion among nurses if our department and the state executives for both the American Red Cross and the tuberculosis association did not agree on every point.

I think placement is the most difficult of a state director's work. We never recommend a nurse to a service to which tuberculosis funds contribute unless her credentials have been discussed with the executive secretary of our state tuberculosis association, and no nurse is recommended for a service to which the Red Cross contributes unless her credentials have been submitted to the assistant director of public health nursing for the American Red Cross in Washington. Each organization extends the same courtesy to our department whether or not official funds are being used to finance the service.

The State Nurses' Association can be a bulwark of comfort and assistance to a director who is professional and tries to have the public health nurses live up to the standards set by the state and national nursing associations.

We make every effort to cooperate with the state medical association as an organization and with individual physicians. The publicity bureau of our state medical association sends us 100 copies of its weekly news bulletin release which we send out with our correspondence. Many of the nurses use this material for publicity in their local papers. One of our hobbies is urging better standards of ethics with the medical profession to the nurses at all times.

Effort is made also to have every public health nurse join the National Organization for Public Health Nursing, and subscribe to the *Public Health Nurse*.

Public health and public health nursing are new; state divisions of public health nursing are newest of all, and much still has to be done before their work fully meets all needs. I cannot think of any greater opportunity to serve or of any work which demands greater energy and ingenuity than that which falls to the lot of state directors of public health nursing.

DISCUSSION

PEARL McIVER

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IN the study which I made of rural staff education last winter, I found that the number of rural nurses per supervisor varied all the way from 10 to 145 in some states. The average is about 30, and when one considers the time involved in getting from one nurse to another, the difficulties of a state supervising nurse are quite evident. The average number of visits to each nurse is twice a year, and the duration of the visit is about two days.

One of the most valuable phases of our staff education work in Missouri has been our combined conferences of health officers and public health nurses. Seven years ago the nurses met for an annual conference and the health officers held their conference at a different place and time. Two years later we sent questionnaires to all health workers suggesting a combined conference, and by far the majority voted for the combined meeting with joint sessions in the morning and sectional meetings in the afternoon. Last year, many health officers asked that all of the sessions be joint sessions because the nurses had many speakers whom the health officers wanted to hear, and the nurses felt the same way about the health officers' section. Thus next year we will perhaps have very few sectional meetings and more joint sessions.

From these conferences we have developed an affiliated society of the American Public Health Association, and the attendance of rural health workers at the annual meeting is almost 100 per cent.

For several years we have been conducting regional conferences for the nurses, and the non-official health agencies, such as the state tuberculosis association and the Red Cross, have been a big help to me in making these meetings successful. The nurses are asked to suggest topics for discussion, and a tentative program is sent to each nurse for her approval, some time before the conference meets. Since the Missouri Public Health Association meeting is held in the spring and the State Nurses Association in the fall, we plan but two regional conferences in each district during the year, one in the summer and one in the winter. The health officers have not had regional conferences until this year. The health officers suggested that the nurses be invited to have their regional conferences at the same place and time as they. Hereafter we shall plan our meetings together.

Like most states, we have found it difficult to supply the demand for well qualified nurses. We have tried to adhere to the State Board of Health regulations, which require a minimum of 4 months' postgraduate work in public health nursing, or in lieu of the postgraduate training, 8 months public health experience under adequate nurse supervision. In a few instances, we have been forced to accept nurses who do not fully meet these requirements.

For this reason we felt the need for a teaching center where prospective public health nurses can be given a rather thorough introduction to the rural field. We have just established such a center in connection with the Boone County Health Department, and we hope that it may solve some of our problems.

Boone County is a rather typical county with a population of 30,000, 11,000

of whom live in Columbia, the county seat. The rural section is divided into two districts, and there is a nurse in each district. There is an additional nurse in Columbia, with a whole-time medical director, a supervising nurse and an office clerk. The funds for the support of this unit come from the county court, the city schools, Red Cross, tuberculosis association, local welfare society, the State Board of Health, the U. S. Children's Bureau, and the International Health Board; so it is truly a coöperative undertaking.

It is our plan to send every nurse who has not had field experience in rural work to the teaching center for a period of observation and practice. The length of this training period will depend upon the previous experience and training of the nurse; but as a general rule we are planning to keep each nurse at the teaching center for 2 months. Those who have had previous public health experience on a city staff, or an approved theoretical course will be placed in counties by themselves, and those who have not had the required 8 months' experience under supervision will be placed in counties where we have a supervising nurse.

At the present time we have two trainees, and we have planned a series of lectures to be given by representatives of the official and non-official agencies in the state, so that the students will know what agencies exist and what may be expected of each. These lectures will be attended by the entire staff of the unit, and also by the nurses employed in the local county hospital.

Following the 2 months at the training center the nurses will spend a few days at the State Health Department executive offices, familiarizing themselves with the various services and visiting the other departments dealing with education and welfare work. They will also have an opportunity to visit the U. S. Public Health Service Trachoma Hospital at Rolla, Mo., the Deaf School, one of the insane hospitals, and the School for Feeble-minded. Eventually, we hope that either Washington University, in St. Louis, or the State University, in Boone County, will include an approved public health course in its curriculum; then we hope to get our students through the university, and our training center will be used as a practice field for rural nursing by the university.

German Health Centers and Health Museums

HEALTH centers, where advice and information are given free to people of all ages, have been established by local authorities and private agencies in practically all the cities of Germany. In Berlin and several other cities, health museums have also been established, containing collections of exhibits intended to teach the principles of hygienic living. The best known of these is the Museum of Hygiene, in Dresden. This museum maintains traveling health exhibits, which have been shown in about 400 cities in Germany and in several other countries. The work of the museum has gained the recognition of the federal and state authorities, and these are now providing financial aid for its activities; previously it was supported mainly by private funds.—*Vorwärts*, Berlin, July 29, 1928.

EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

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MEASLES

THE etiology of measles and its control still remain among the major problems, the first being for the laboratory to clear up, the second for the health officer. The disease is almost universal in its prevalence, and few individuals escape it. It is one of the greatest perils of early childhood, death occurring especially between the ages of 6 and 36 months. The general cause of death is some type of pneumonia, the exact cause of which is not certainly known. While it is generally believed that the pneumonia is induced by a secondary infection, it has been suggested that the microörganism of measles itself is responsible. There are a number of reasons which strongly suggest the latter.

There are conflicting claims as to the germ responsible for the causation of measles, and the most that can be said at present is that the question is undecided. Animal sera have been produced by immunization against several of the germs isolated by different workers. In this country quite glowing reports have been given by certain observers of the protection afforded by the serum of goats immunized against Tunnickliff's organism. Hoyne and Gasul¹ reported 88 per cent protection of 44 exposed non-immunes, the remaining 12 per cent having had only a mild attack. Halpern² claims to have produced protection in 63 per cent of 45 patients exposed. Of the remainder, 17 developed the disease in a mild form, which the author speaks of as an "attenuated form," for just what reason it is not clear, since so many children have a mild type of the disease under any circumstances.

A recent critical study of four immune sera has been made in England:³ (1) Tunnickliff's horse serum, (2) Ferry and Fisher's horse serum, (3) Degkwitz's sheep serum, and (4) Serum from convalescent

cases of measles. While the animal sera, with the exception of Ferry and Fisher's, gave some protection, all were found deficient, and all gave a certain number of serum reactions, running as high as 33.3 per cent for one. On the other hand, human convalescent serum gave no reactions, and apparently protected in 95.7 per cent of the cases in which it was used. Approximately 22 per cent of the control cases escaped infection, showing that the negative history was either inaccurate or that the patients were naturally immune, so this finding must be taken into consideration in judging of the protection apparently afforded by the sera.

Our conclusions, derived from a rather extensive review of the literature, accord with those reached by Gunn as the result of the experiments just recorded,—namely that all animal sera so far produced are uncertain and deficient in protective power, and that human convalescent serum is the only reasonably sure prophylactic known. Its use has been shown to be safe, free from unpleasant reactions, and dependable. The great drawback to its extensive employment lies in the difficulty of obtaining it in sufficient quantities. We must still hope for the production of an animal serum which will be free from this drawback.

REFERENCES

1. *J. A. M. A.*, Oct. 9, 1926, p. 1185.
2. *J. A. M. A.*, Apr. 7, 1928, p. 1109.
3. *Lancet* (London), Oct. 6, 1928, p. 690.

BREAD AND YEAST

THE amazing success of the campaign by certain manufacturers to encourage the eating of yeast gives interest to any information concerning this remarkable plant. Additional interest comes from the tendency evident in many parts of the world to "purify" wheat flour. This purification consists in the complete removal of the hull and the germ, those parts of the grain which carry the vitamins, protein and mineral salts. In general, the same statement may be made concerning another staple food, rice, the study of which began, and has added greatly to, our knowledge of vitamins.

In this country, eating of yeast holds the public attention to a remarkable degree, but there is little discussion over the excessive milling and refinement of flours, except among specialists. In England the question of white bread as against wholemeal bread has been more or less active for a number of years, and is especially so at present, owing to the formation of a society, some of the members of which regard the use of white bread as a crime, and the wide publication of articles by certain prominent men.

In that country, wholemeal bread is somewhat more expensive than white bread, and since bread makes up about two-fifths of the food-stuff of the population, many of whom are extremely poor, the importance of the matter from a national standpoint is evident.

Some have taken comfort in the supposed protection afforded by the use of yeast to raise bread. It has, however, been shown that the amount of yeast added, as well as that present at the time of baking, averages slightly above 1 per cent, which is not enough to make up for the loss due to high milling; indeed, it is only about one-tenth of what is required to give a sufficiency of vitamin B. It has been definitely shown that vitamin B contains at least two factors, both of which are necessary for health and growth, and recent experiments¹ have shown that the addition of 2 to 4 per cent of dried yeast will produce a bread equal nutritively to the best wholemeal product. Such a bread is palatable and cheap. Vienna bread, which is imitated in many parts of the world, and is noted for its palatability, contains an unusually large amount of yeast. The addition of yeast requires no new machinery such as would be required for a decided change in the milling processes. It seems probable that brewer's yeast is better fitted for this purpose than other yeasts; and it must be dried at a sufficiently high temperature to destroy the diastatic enzymes, in order to avoid undue fermentation which an excess of yeast might bring about. Any yeast which is to be utilized should be examined, and tested for its vitamin B content. As far as experiments show, its use, even in large quantities, is free from danger, and the proteins which it contains are utilizable in from 30 to 50 per cent of the total diet.

The entire question is one of increasing importance, owing to the growing practice of bleaching flours which are highly milled to begin with, the substances used in bleaching tending to destroy what vitamins may be left.

REFERENCE

1. *Lancet*, London, Sept. 29, 1928, p. 668.

THE PATIENT AMERICAN!

A NEW view on the American comes from an English medical journal¹ in a review of the brochure on scarlet fever issued by the U. S. Public Health Service. The criticism is made that it is much too long (5,000 words), at least for British consumption. The British are said to become bored after reading two thousand words, and anything beyond this usually leads to impatience and exhaustion, so that the article is likely to be cast aside. The opinion is ventured that the

Americans, contrary to what is usually believed of them, read and listen better and for longer periods than the English.

We wonder how much truth there is in this conjecture. We believe that it is fallacious. Among the outstanding characteristics of Americans is an enormous energy in doing things—which may extend to learning how to do them—but an impatience with presentations which are too long and deal too much with details, unless these details are necessary for the accomplishment of work.

Very recently, we have read a criticism of a book² in which its length and size, and the consequent fatigue of holding it during perusal, are emphasized. We note in a number of reviews that the weight of paper upon which a book is printed is mentioned, and the light-weight paper of the English publishers commended. Our observations also lead us to believe that the average American reader does what women are accused of doing with novels—reading the last page first. For scientific articles this means reading the conclusions. If the reader is particularly interested in the subject and needs further information, the article may be studied. Further, practically all medical and public health journals have cut down on bibliography and history. There are several reasons for this, such as the expense of printing, and a pretense of study often not justified; but we believe that the great reason lies in the desire of readers for a concise presentation of facts.

There is no question that an enormous amount of work is being done in this country, and just as little question that the individual workers will dig into literature with almost inexhaustible patience when necessary. On the other hand, we are compelled to believe that the average American is not so familiar with literature, so widely read, nor so patient in acquiring knowledge as the average Englishman or European. Vaughan,³ in advocating the historical method of teaching, points out that when meningitis appeared in America, we lost many precious months in learning facts which had been “demonstrated conclusively by French army surgeons in the first half of the 19th century.”

While we appreciate the compliment to our American people, we fear that we cannot accept it without reservation.

REFERENCES

1. *Med. Off.*, July 21, 1928.
2. *South. M. J.*, June, 1928.
3. *Epidemiology and Public Health*, Vol. I, p. 9.

ASSOCIATION NEWS

COMMITTEE ON COÖPERATION, DEVELOPMENT AND FINANCE

At the Governing Council meetings in Chicago a new Committee on Cooperation and Development was authorized, this committee being charged with the study of fundamental Association problems, including those relating to affiliated societies, and to work out suitable coöperating relationships with other national and local agencies that are active in the field.

A motion of the Finance Committee which was approved by the Council, recommended the enlargement of the Finance Committee with a view to studying the financial structure of the Association and developing a financial policy adequate to carry out the Association's growing program.

An amendment to the By-laws provides that the chairman of the committee shall be a member of the Executive Board.

These two committees have been joined in the new Committee on Cooperation, Development and Finance, which held its first meeting in the offices of the Association on November 10. The committee first addressed itself to the task of formulating a simple statement of the principal aims and objectives of the Association. It has requested several sub-committees and standing committees of the Association to elaborate on several parts of this statement.

The present personnel of the committee is: Louis I. Harris, M.D., Chairman, W. S. Rankin, M.D., C. F. Wilinski, M.D., Sally Lucas Jean, Abel Wolman and Arthur Gorman, together with the President, Treasurer and Secretary who are members ex officio.

The next meeting of the committee

will be held on December 7, following which they will have a joint dinner with the Executive Board which meets on December 8.

MINNEAPOLIS LOCAL COMMITTEE

The President has appointed William F. Kunze as Chairman of the Local Committee for the 58th Annual Meeting to be held in Minneapolis, Minn., during the week of September 30, 1928. Mr. Kunze is director of the Minneapolis Department of Public Welfare and is President of the Hennepin County Public Health Association.

OHIO SANITARIANS MEET

There were 305 registered and affiliated members attending the Ninth Annual Meeting of the Conference of Ohio State Health Officers and the Ohio Society of Sanitarians held November 7-10 at Columbus, O., and of this number 200 were health officers and public health nurses.

The following officers were elected: President, C. D. Barrett, M.D., Loraine County; First Vice-president, Edgar R. Hiatt, M.D., Health Commissioner of Miami County; Second Vice-president, Marion Howell, R.N., Western Reserve University; Secretary-treasurer, E. R. Schaffer, M.D., Ohio State Department of Health; James A. Beer, M.D., F. Holman Waring, and Mrs. Zoe McCaleb, members Executive Committee.

Harry L. Rockwood, M.D., Health Officer of Cleveland, was elected as representative on the Governing Council of the A. P. H. A.

W. F. Walker, D.P.H., field director for the Committee on Administrative Practice, represented the American Public Health Association.

This meeting was considered the best that the Ohio health officers have had and among the outstanding contributions were the papers read by Frank G. Boudreau, M.D., representing the Health Division of the League of Nations, Geneva, Switzerland, who was also elected an honorary member of the Ohio society; Walter Simpson, M.D., of Miami Valley Hospital, Dayton, O., on "Tularemia"; and Edward Francis, M.D., on "Tularemia and Undulant Fever"; and by Dr. Rockwood on "Control of Tuberculosis."

While in Ohio, Dr. Walker took the opportunity to discuss with Dr. Monger, Ohio State Health Officer, the survey of health activities of the Ohio State Department of Health, recently made by James Wallace, M.D., associate to Dr. Walker.

DEATH OF MRS. SEDGWICK

Mrs. Mary Sedgwick, the widow of the late Dr. William T. Sedgwick, a former President of the Association, died Tuesday morning, November 6, in New York, N. Y. Mrs. Sedgwick had been confined to her bed for over a year, due to an injury received in a fall. Funeral services which were held at the St. Luke's Hospital Chapel, New York, N. Y., were attended by several of Professor Sedgwick's former students at Massachusetts Institute of Technology and representatives of the Association.

NEW OFFICERS FOR DELTA OMEGA

Lieutenant Colonel Edward G. Huber, of the U. S. Army Medical Corps, was elected president of the honorary public health society, Delta Omega, at its fifth annual meeting, held at Chicago, October 15, 1928, during the convention of the American Public Health Association. C. C. Young, D.P.H., Michigan State Department of Health, was elected vice-president, and James A. Tobey, LL.B., Dr.P.H., New York, was re-elected secretary-treasurer. The Delta Omega Society now has about 200 mem-

bers belonging to six chapters located at the Johns Hopkins School of Hygiene and Public Health, the Harvard University School of Public Health, the Massachusetts Institute of Technology, the University of Michigan, the Yale School of Medicine, and the University of California.

MR. FULLER CALLS ON DR. HARRIS

Before leaving Chicago, where he was elected President of the American Public Health Association, George W. Fuller called on Malcolm L. Harris, M.D., the president-elect of the American Medical Association. Mr. Fuller paid his official respects to Dr. Harris and assured him of his desire to coöperate with him to bring about a better understanding between public health workers and the medical profession.

DEATH OF FRED BERRY

Fred Berry, 44 years of age, Chief of the Division of Laboratories, Ohio State Department of Health, Fellow of the American Public Health Association, and a frequent contributor to the AMERICAN JOURNAL OF PUBLIC HEALTH AND THE NATION'S HEALTH, died at his home in Columbus, October 20, after several months' illness from Bright's disease.

Mr. Berry was graduated from the Ohio State University in 1906 and immediately became affiliated with the Department of Laboratories of the Ohio State Department of Health. He held a Master's Degree from the Ohio State University and at the time of his death he was completing his thesis for his Ph.D. degree from the University of Chicago.

In 1918 he resigned from the department, to join Dr. J. McI. Phillips in the operation of the Columbus Pasteur Institute, and a year later he returned to the State Department of Health to become chief of the division of laboratories.

NEW MEMBERS

- Fred L. Adair, M.D., Minneapolis, Minn. (Assoc.)
- Magnus W. Alexander, New York, N. Y. (Assoc.)
- Henry A. Allen, Chicago, Ill., Mechanical Engineer in charge of Department Public Works, Bureau of Engineering
- John S. Bengston, Ph.G., D.V.M., Washington, D. C., Bacteriologist and Pathologist, Bureau of Animal Industry, U. S. Department of Agriculture
- Clifford E. Blackburn, Toronto, Ont., Member Toronto Health Board
- Ruth Alice Boak, M.S., Albany, N. Y., Assistant in Research, Department of Pathology, Albany Medical School
- Emily F. Bolcom, M.D., Boise, Ida., Director Bureau of Child Hygiene, Department of Public Welfare
- Faye C. Bowen, Jackson, Mich., County Nurse
- Herbert E. Bowman, Ph.G., Somerville, Mass., Milk Inspector and Milk Bacteriologist
- J. L. Bowman, M.D., Montgomery, Ala., County Health Officer
- Alfred David Browne, M.D., Nashville, Tenn., Professor of Health Education, Peabody College
- Francis H. Bulot, Chicago, Ill., Consulting Sanitary Engineer
- Clare W. Butler, Albany, N. Y., Temporary Research Statistician, State Department of Health
- John Deere Cady, Chicago, Ill. (Assoc.)
- Douglas Launeese Cannon, M.D., C.P.H., Montgomery, Ala., Acting State Health Officer
- Lillian S. Carlson, Chicago, Ill., Tuberculosis Field Nurse, Washington Blvd. Dispensary
- Philip R. Carter, Minneapolis, Minn., Milk Sanitation, Division of Sanitation, State Department of Health
- Frances Cohen, A.B., M.D., New York, N. Y., Assistant Director of Educational Hygiene, Department of Education, Department of Health
- Jacob George Cohen, B.A., Minneapolis, Minn., Secretary American Mouth Health Association
- Marion B. Coleman, B.S., Albany, N. Y., Assistant Bacteriologist, Division of Laboratory and Research, State Department of Health
- William Rogers Copeland, B.A., Hartford, Conn., Sanitary Engineer, State Water Commission
- Elsie Cressman, Los Angeles, Calif., Public Health Nurse, Los Angeles Maternity Service Association
- G. Gale Dixon, Sc.B., Youngstown, O., Civil and Sanitary Engineer
- Anna M. Doyle, R.N., Hamilton, O., Superintendent of Nurses, Public Health League
- Anna McMillan Drake, R.N., Cincinnati, O., Assistant Secretary, Public Health Federation
- George A. Dundon, Milwaukee, Wis., Director of Health Education, Department of Health
- Eunice H. Dyke, R.N., Toronto, Ont., Director Division of Public Health Nursing, Department of Health
- Avis Emily Edgerton, Lock Haven, Pa., Teacher in Health Education
- Jean C. Fisher, R.N., Ambridge, Pa., School Nurse
- Mary H. Flynn, R.N., Franklin Park, Ill., Public Health Nurse, Cook County Department of Health
- Edward G. Folsom, Mt. Clemens, Mich., Health Officer
- Annette M. Fox, Lansing, Mich., District Nurse, State Department of Health
- Dr. A. A. Freedman, Chicago, Ill., Tuberculosis Worker, Racine Avenue Dispensary
- Mona E. Gaskin, R.N., Lansing, Mich., Nurse State Department of Health
- Carl C. Gibbs, Lake Forest, Ill., Sanitary Engineer
- H. S. Gove, M.D., Linn, Mo., Health Officer, Osage County
- Edmund Alexander Grant, D.D.S., Toronto, Ont., Director of Dental Services, Department of Health, and Secretary Canadian Dental Hygiene Council
- W. W. Gray, M.D., St. Joseph, Mo., Health Officer
- Thomas Coleman Green, M.A., Austin, Tex., Superintendent and Chemist in Charge, Filtration Plant
- Willard Parker Greene, M.D., Minneapolis, Minn., Epidemiologist Division of Preventable Diseases, State Department of Health
- Willard N. Greer, Ph.D., Philadelphia, Pa. (Assoc.)
- John Gerard Hardenbergh, V.M.D., Plainsboro, N. J., Sanitary Supervisor and Laboratory Worker, The Walker-Gordon Laboratory Company (Assoc.)
- Harry Gordon Harding, Ph.D., Akron, O., Dairy Technologist, Akron Pure Milk Company
- James E. Harper, M.S., Boston, Mass., Milk and Dairy Inspector, Massachusetts Guernsey Breeders Association

- E. J. Henryson, Minneapolis, Minn., Publisher of Health Education Literature, Charts, Posters, etc.
- Joseph Howard Hickson, M.D., New Haven, Conn., Sanitary Inspector, Yale University
- E. J. Higgins, M.D., Joliet, Ill., Commissioner of Health
- S. Rowland Hill, M.D., Lansing, Mich., Health Officer
- Margaret M. Hughes, Chicago, Ill., Tuberculosis Worker, South Side Dispensary
- Eden B. Hunt, Philadelphia, Pa. (Assoc.)
- George William Hunter, Ph.D., Claremont, Calif., Director of Health for Colleges, and Professor of Biology, Pomona College
- George Kernohan, D.V.M., M.S., Petaluma, Calif., Director Avian Pathology Laboratory, University of California
- Irl Brown Krause, M.D., Jefferson City, Mo., Assistant Health Commissioner and Director Division of Child Hygiene, State Department of Health
- Henry C. Lapp, North Tonawanda, N. Y., Health Officer
- Nathan E. Lazarus, Buffalo, N. Y., Consulting Sanitarian, Dairy Industry
- E. G. Le May, Ph.G., Austin, Tex., Director Bureau of Food and Drugs, State Department of Health
- George C. D. Lenth, Chicago, Ill., Consulting Engineer
- Estelle D. Leonard, Chicago, Ill., Tuberculosis Worker, State Street Dispensary
- Hattie Frances Long, R.N., Parkersburg, W. Va., School Nurse
- Charlotte Ludington, R.N., Detroit, Mich., Field Nurse, State Department of Health
- Daniel P. MacMillan, Ph.D., M.D., Chicago, Ill., Director Bureau of Child Study and Physical Examination of Teachers
- Helen M. Maher, R.N., New York, N. Y., Superintendent of Nurses, Department of Health
- Olive B. Marty, R.N., Cairo, Ill., Rural School Nurse
- Donald H. Maxwell, S.B., Wilmette, Ill., Hydraulic and Sanitary Engineer
- Nelle McClintock, R.N., Ottawa, Ill., Public Health Nurse
- Ida McNeff, Chicago, Ill., Tuberculosis Worker, Sedgwick Street Dispensary
- Kent Churchill Melhorn, M.D., Commander (M. C.) U. S. Navy, Port au Prince, Haiti, Director General Public Health Service (Assoc.)
- Richard Messer, Richmond, Va., Chief Engineer, State Department of Health
- Walter H. Miles, M.D., B.S., Oklahoma City, Okla., Director of Health Department
- Bernice Amanda Miller, Chicago, Ill., Metropolitan Director of Health Education, Y. W. C. A.
- Agnes Fay Morgan, Ph.D., Berkeley, Calif., Professor of Household Science, University of California
- Howard E. Moses, B.A., Harrisburg, Pa., Assistant Chief Engineer, State Department of Health
- Mabel Gray Munro, South Bend, Ind., Superintendent Visiting Nurse Association
- Mary E. Murphy, Ph.B., Chicago, Ill., Director Elizabeth McCormick Memorial Fund
- Esther Nash, R.N., Lansing, Mich., Public Health Nurse, State Department of Health
- Charles G. Phillips, Montclair, N. J., Head of Board of Health as Mayor
- A. S. Pinto, M.D., Omaha, Neb., Health Commissioner
- B. F. Pirc, M.D., Belgrade, Yugoslavia, Chief Statistician, Central Hygiene Institute (Assoc.)
- Rutherford J. Posson, B.S., Washington, D. C., Manager Washington Dairy Council
- Myrtle Preddis, R.N., Berwyn, Ill., Public Health Nurse, Cook County Health Department
- J. M. Quigley, M.D., Clearfield, Pa., President Board of Health
- Clareiss Thomasine Rayne, Lawrence, Mass., Student in Public Health, Massachusetts Institute of Technology (Assoc.)
- Harry Kirke Read, M.D., Houston, Tex., Supervisor of Hygiene, Public Schools
- John Joseph Regan, D.V.M., New York, N. Y., Chief Veterinarian and Director of Laboratories, Dairymen's League
- Frank E. Rice, Chicago, Ill., Executive Secretary, Evaporated Milk Association
- Frank C. Roe, Jr., B.S., Chicago, Ill., Sanitary Engineer
- Bertha Rose, M.D., Michigan City, Ind., School Physician
- Mabel J. Rue, B.S., St. Louis, Mo., Educational Director, Visiting Nurse Association
- Fred A. Safay, Jacksonville, Fla., District Sanitary Officer, Bureau of Engineering, State Department of Health
- M. Scherago, Lexington, Ky., Head of Department of Bacteriology, University of Kentucky
- Dora Sharp, Macomb, Ill., Director of Physical Education, Western Illinois State Teachers College
- Ellen Sizelove, Chicago, Ill., Tuberculosis Worker, South Side Dispensary
- Channing G. Smith, M.D., Granger, Ia., Chairman Committee Council of Iowa State Medical Society
- Grace M. Sonnenschein, Chicago, Ill., Tuberculosis Field Nurse, Stock Yards Dispensary
- Bert Landon Stinson, Amite, La., Director Parish Health Unit
- Carroll P. Streeter, St. Paul, Minn., Health Editor, *The Farmer's Wife*

Harold C. Stuart, Litt.B., M.D., Boston, Mass., Assistant Professor of Child Hygiene, Harvard School of Medicine and Public Health
 Anabel Stubbs, Chicago, Ill., Tuberculosis Worker, Racine Avenue Dispensary
 Tadashi Suzuki, M.D., Kyoto, Japan, Director of Oriental Child Health Association (Assoc.)
 Elizabeth C. Tandy, D.S., Washington, D. C., Director Statistical Division, U. S. Department of Labor, Children's Bureau
 Harold A. Tarbell, M.D., Newark, N. J., Bacteriologist, Department of Health
 Ralph Edwin Tarbett, S.B., Washington, D. C., Chief Sanitary Engineering Section, Domestic Quarantine Division, U. S. Public Health Service
 Matilda Margaret Thuman, Cambridge, Neb., School Nurse
 William M. Wallace, Detroit, Mich., Superintendent of Filtration, Water Works
 George N. West, D.D.S., Chicago, Ill., Mem-

ber of Public Service Committee, Chicago Dental Society
 Onalee E. Whipple, Pontiac, Mich., with Bureau of Records and Health Education
 William G. Willard, M.D., Benzonia, Mich., Health Officer
 Eva M. Wilson, M.D., Manhattan, Ill., Lecturer, State Farmers' Institute
 Katherine M. Wilson, Godfrey, Ill., Nurse in Girls' School
 Carl Albert Wilzbach, M.D., Cincinnati, O., with Public Health Federation of Cincinnati and Cincinnati Social Hygiene Society
 Frederick K. Wing, C.E., Buffalo, N. Y., Sanitary Engineer
 Jacob M. Wisan, D.D.S., Elizabeth, N. J., Chairman Oral Hygiene Committee of Union County Dental Society and Member State Committee Oral Hygiene
 Rachelle S. Yarros, M.D., Chicago, Ill., Director Social Hygiene Council

LETTER TO THE EDITOR

TO THE EDITOR:

There seems to exist a considerable misunderstanding as to the auspices under which the various health demonstrations in the United States have been conducted. This misunderstanding appears to prevail not only among the general public, but to some extent among the medical profession and through the public health field. Statements have recently been published to the effect that the health demonstration in Mansfield, O., completed two or three years ago, was financed and directed by the Commonwealth Fund. At the recent meeting of the American Public Health Association in Chicago, the inaccurate statement was made by one of the speakers that the demonstrations of the Commonwealth Fund are operated by the American Child Health Association. It therefore seems worth while in the interest of clarity to make the following statement:

The Child Health Demonstration Committee of the Commonwealth Fund has financed and conducted a health

demonstration in Fargo, N. D. This demonstration was completed December 31, 1927. The same committee of the Fund has also conducted demonstrations in Clarke County, Ga.; in Rutherford County, Tenn.; and in Marion County, Ore. The first two of these will be completed December 31, 1928. The Marion County Demonstration will continue until the conclusion of the 5-year period as agreed upon. The Commonwealth Fund is responsible, and exclusively responsible, for the policies adopted in the operation of the above named demonstrations. It is not responsible for any other health demonstration whatsoever, and has never had any connection, financial or other, with any other health demonstration.

I shall appreciate it if you will publish this statement in your valuable journal.

Barry C. Smith,
 Director

The Commonwealth Fund,
 New York, N. Y.,
 October 20, 1928

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

Wholesale Life Saving—The practicing physician is compared to the retailer and the public health officer to the wholesaler in the promotion of the public health. The physician considers the individual as a unit while the public health worker must think in terms of the community as a whole. The physician writes the individual prescription for the patient while the health officer must lay out a broad and far-reaching program. The physician has been trained in the school of defense, to attack disease as it appears. The health officer has been trained in the school of attack, the application of preventive measures.

Public health work has increased rather than decreased the practice of competent physicians; to function properly health organizations must have the coöperation of organized medicine; aside from the control of communicable disease, the care of the indigent sick is not a public health problem; special training is essential for the public health worker; preventive medicine should be emphasized in teaching in medical schools; every physician's office should be a health center; health departments and unofficial health organizations should not practice curative medicine.—Homer N. Calver, *Retail or Wholesale Life Saving: Which Pays the Better?*, *J. A. M. A.*, 91: 1285 (Oct. 27), 1928.

Measles Antitoxin—During an outbreak of measles in Detroit, Mich., antitoxin prepared from a green-producing streptococcus isolated by Ferry & Fisher was used to protect contacts against measles in certain institutions.

At the Children's Hospital, where the treated patients were controlled with an equal number of untreated patients under the same conditions, the computed actual protection, following the use of 20 c.c. measles streptococcus antitoxin, was 88 per cent. At the Herman Kiefer Hospital 10 c.c. of antitoxin was used and controlled with a much larger number of untreated cases and also controlled with a group which received 5 c.c. measles convalescent serum. The computed protection with antitoxin was 42 per cent compared with 19 per cent for those treated with measles convalescent serum.—N. S. Ferry, *et al.*, *Clinical Results with Measles Streptococcus Toxin and Antitoxin*, *J. A. M. A.*, 91: 1277 (Oct. 27), 1928.

Small Town Survey—A sanitary and health survey was made of 18 incorporated towns and 1 small city all located in Darke County, O. Each house in the county was visited and inspected between June, 1927, and February, 1928. Residents were interviewed with regard to family history and tabulations were made of sanitary conditions found. The federal census for 1920 gave 16,167 as the population. The population actually found or estimated by the surveys was 14,111, showing a loss of 12.7 per cent. In this population there resided 931 individuals who gave a history of having suffered from typhoid fever at some period of their lives. This represents 7.9 per cent of the population. Four hundred and fifty-three individuals have had smallpox. It was found that 60 per cent were unprotected by previous attack of

the disease or by recent or remote vaccination. Approximately 80 per cent of the children of school age were unprotected.

Among the outstanding health problems demanding the attention of the various authorities are the safeguarding of the milk supply, the elimination of typhoid carriers from food handling establishments, adequate protection of the water supply, safe disposal of sewage, immunization against smallpox and diphtheria, location and care of tuberculosis cases and health education.—M. E. Barnes, *The Health Problems of the Small Town as Determined by the Survey Method*, *Ohio State M. J.*, Sept., 1928.

Diphtheria Prevention Campaigns
—During the past several years local communities throughout the country have been carrying on intensive campaigns to secure the immunization of young children against diphtheria. During such campaigns the health department has established many free clinics, at which toxin-antitoxin could be secured. These have included the regular health department clinics, infant welfare stations, school clinics and other special clinics. In Syracuse and Detroit campaigns are now being inaugurated in which there will be no free clinics but the health department will devote all of its energy toward securing immunization at the hands of the family physician. The outcome of such a pro-

gram will be watched with keen interest. Success depends upon the united support of organized medicine. In each instance the health department will, of course, continue its policy of education through the many channels which have been used for this purpose and will also serve as a depository for records. (Those who are carrying on campaigns this year involving unique features are urged to submit their experiences to the Editor of this section of the JOURNAL.)

Bellevue-Yorkville Demonstration
—In October, 1928, the Bellevue-Yorkville Health Demonstration in the City of New York issued a reference handbook on the principal causes of mortality during the pre-demonstration. The handbook, which consists of tables and charts, was prepared by G. J. Drolet, Consulting Statistician. There are portrayed the vital statistics for the 5 years, 1922–1926, with separate information for 1925 and 1926, intended as a handbook in guiding projects and in measuring the progress of the work which has been undertaken. Separate data have been published for each of the 25 sanitary areas, and the general death rate of each area has been standardized to enable comparisons with other areas and with the United States as a whole. The general death rate during the 5-year period averaged 17.35; standardized, 16.99. Leading causes of death were organic heart disease, pneumonia, accidents, tuberculosis and cancer.

LABORATORY

C. C. YOUNG

COMPARATIVE STUDIES IN THE LABORATORY DIAGNOSIS OF SYPHILIS

MARCELLA OGLESBY AND HAROLD J. KNAPP, M. D., FELLOW A. P. H. A.

Laboratories of the Division of Health, Cleveland, O.

THREE thousand sera were tested by the Wassermann, Kahn and microscopic slide precipitation tests, in an effort to devise a reliable and practicable system for the diagnosis of syphilis in this laboratory. It was thought that this series would aid in the evaluation of the relative merits of the three tests.

The Wassermann test was performed according to the Cleveland Method,¹ with a cholesterolized antigen of exceptional sensitivity.

The Kahn test was performed as described by Kahn² in his book, *Serum Diagnosis of Syphilis by Precipitation*, with a standard antigen kindly supplied by him. Later a standard Kahn antigen prepared by us, but titrated also in Dr. Kahn's laboratory, was used.

The microscopic slide precipitation test was performed as described by Kline and Young,³ except that mixing was done by rotation alone, the use of a toothpick having been found unnecessary by the authors of the test, since the publication referred to. The antigen was furnished by Dr. Kline, and was prepared by him as described in a re-

cent article.⁴ The "very sensitive emulsion" was used in this series.

The results of the comparative tests are recorded in the following tables. (In cases of disagreement, whenever there was sufficient sera, tests were repeated.)

The agreement between the three tests was, on the whole, very close. Greater positivity was shown by the Wassermann and slide tests, in both of which the most sensitive antigens were used, than by the standard Kahn test. It is reasonable to assume that greater agreement would have been reached if the special, more sensitive Kahn antigen had been used, as in his presumptive test.⁵ The high positivity of the Wassermann in this series is believed to be due in part to the unusual sensitivity of the Wassermann antigen used. This antigen was so sensitive that routine replacements of it would be unlikely. It is probable that in a routine procedure where antigens of ordinary sensitivity are used, relatively more positive results would be obtained by both Kahn and slide tests.

TABLE I

	TOTAL No.	POSITIVE	DOUBTFUL	NEGATIVE	A. C.
KAHN	3,000	548 = 18.26%	52 = 1.73%	2,400	
WASSERMANN	3,000	643 = 21.43%	19 = 0.63%	2,338	33
SLIDE	3,000	662 = 22.06%	53 = 1.76%	2,285	

++, +++ and ++++ are considered positive; + and ±, doubtful.

TABLE II

TOTAL No.	COMPARISON OF WASSERMANN AND KAHN TESTS	
3,000	99 positive Wassermann reactions gave negative Kahn reactions	Agreement 93.2%
	34 negative Wassermann reactions gave positive Kahn reactions	
	53 Wassermann reactions gave weaker Kahn reactions	Agreement and
	14 Wassermann reactions gave stronger Kahn reactions	Rel. Agr., 95.5%
COMPARISON OF WASSERMANN AND SLIDE TESTS		
3,000	66 positive Wassermann reactions gave negative Slide reactions	Agreement 93.4%
	63 negative Wassermann reactions gave positive Slide reactions	
	29 Wassermann reactions gave weaker Slide reactions	Agreement and
	38 Wassermann reactions gave stronger Slide reactions	Rel. Agr., 95.6%
COMPARISON OF SLIDE AND KAHN TESTS		
3,000	106 positive Slide reactions gave negative Kahn reactions	Agreement 92.7%
	17 negative Slide reactions gave positive Kahn reactions	
	83 Slide reactions gave weaker Kahn reactions	Agreement and
	12 Slide reactions gave stronger Kahn reactions	Rel. Agr., 95.9%
ANTICOMPLEMENTARY REACTIONS		
33	17 A. C. reactions gave positive Kahn reactions	
	21 A. C. reactions gave positive Slide reactions	

Positives with positives, doubtfuls with doubtfuls, negatives with negatives, are considered agreements; positives with doubtfuls are considered relative agreements; only positives with negatives are considered disagreements.

To determine the merits of the microscopic slide method as compared with the tube method, the following tests were performed on 1,000 sera: one, the regular slide test with Kline antigen; the other, a tube test exactly like the Kahn, except that the same Kline antigen was employed as was used in the slide test. There were no disagreements. There were sixteen relative agreements in which the slide test gave more strongly positive results, and one in which the tube test showed stronger positivity.

This would seem to indicate that clumping on the slide is somewhat better than in the tube. Microscopic readings in the slide test are striking, and are much easier to read than are macroscopic readings in a tube.

A comparison of the standard Kahn antigen with the Kline "very sensitive antigen emulsion" was made by performing two tests on each of 1,000 sera: one, the standard Kahn test; the other, a test similar in every respect, but utilizing the Kline antigen.

The results of this comparison are given in Table III:

A comparison of the Kahn Presumptive Test with the slide test using Kline V. S. A. E. would be interesting, and is in prospect.

CONCLUSIONS

Innumerable Kahn tests performed in various laboratories have established the reliability of precipitation procedures in the diagnosis of syphilis. It has been decided to discontinue the Wassermann

TABLE III

TOTAL No.	COMPARISON OF RESULTS WITH TWO ANTIGENS	
1,000	51 tests positive with Kline V. S. A. E. were negative with standard Kahn	
	4 tests positive with standard Kahn were negative with Kline V. S. A. E.	
	20 tests gave stronger reactions with Kline V. S. A. E.	
	7 tests gave stronger reactions with standard Kahn	

in the Cleveland Division of Health Laboratories, and replace it with two precipitation tests: the standard Kahn, and the slide with the Kline V. S. A. E. It is believed the two will supplement each other excellently. The standard Kahn is a well-tried test of satisfactory sensitivity. In the slide test, a maximum of sensitivity will be obtained. Local experience thus far indicates that a negative slide test (Kline V. S. A. E.) gives as complete an assurance of freedom from luetic infection as may be given by any one serologic test. It should therefore be of especial value in problems of immigration, food control, or court action.

The presumptive Kahn may give the same assurance, but it has not been tried out in this laboratory. The slide test was chosen rather than the presumptive Kahn because it requires less serum, is easier to read, quicker to perform, and gives uniform results at low temperatures.

The determination of the occurrence or absence of non-specific reactions in the slide test using the V. S. A. E., as in the Kahn presumptive test, should be

left to clinical workers, since clinical data obtained at a public health laboratory are both meager and unreliable. However, data presented in work as yet unpublished by Kline, *et al.*, indicate that the Kline reaction is specific.

In these laboratories, disagreements between the two tests are carefully rechecked. Where serum is positive by the slide test and negative by the Kahn, a Kahn presumptive test is performed, and also a slide test using the sensitive antigen emulsion. Better results are thus obtained than was possible with a single Wassermann; while less time, effort, and expense are required, due to simplicity of procedure in precipitation tests.

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VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

Deaths of Wage Earners—Figures based on conditions existing among wage earners insured in the Metropolitan Life Insurance Company, show that wage earners who die between the ages of 35 and 45 years leave on the average 2.7 young children. Those dying between 25 and 35 years leave on the average 2.1 dependent children, while those under 25 leave 1.4 such dependents. Of all the fathers, aged 35–44, who died with dependent issue, more than 70 per cent left 2 or more children under 16. Nearly one-fifth of such fathers left 4 children, and nearly one-fifth, 5 or more children. Among the fathers dying between 25 and 35, approximately 60 per cent left 2 or more dependent children; while of deceased fathers below 25, about one-third left 2 or more dependent children. Foreign born fathers leave more dependents, on the average, than do the native born, but the number left by colored men does not differ essentially from that by whites.

A relatively few causes of death are responsible for the major part of this family damage. In the interval 25–44 years, nearly 6 deaths out of every 10 among white male wage earners were due to tuberculosis, influenza, pneumonia, heart disease and accidents. These conditions cause, respectively, 22.7 per cent; 12.6 per cent; 11.5 per cent and 14.2 per cent of the total mortality.—*Stat. Bull.*, Met. Life Ins. Co., 9: 7–9 (Sept.), 1928.

Deaths among Jews—A study was made in 1925 of the mortality records of 557 Jews in the State of New York, outside of New York City. Buffalo

recorded 141 deaths among Jews, Albany 55, Syracuse 41, and Mount Vernon 21. Seventy-six deaths occurred in rural New York, and 35 of these were in Sullivan County where there are a number of tuberculosis sanatoria. It was found that 36.2 per cent of the decedents were native born, and 63.6 per cent foreign born. Forty per cent were Russian by birth; 8.8 per cent Polish; 5.0 per cent German; 4.8 per cent Austrian; 1.7 per cent Hungarian and 0.8 per cent English, Scotch or Welsh.

The proportion of deaths from heart disease was higher among Jews than for the general population of the state, exclusive of New York City, being 23.0 per cent of all deaths for the former and 20.5 for the latter. In the age group 15–24 years the proportion ascribed to heart disease was three and one-half times greater than the corresponding figure for the general population. The deaths due to diseases of the respiratory system were 10.9 per cent of all deaths among Jews and 8.7 per cent among the general population. The excess was particularly marked after the 65th year, being 14.9 per cent for Jews and only 7.1 per cent for the general population. The proportion of deaths from cancer was somewhat lower among Jews, being 8.2 per cent, as contrasted with 9.1 per cent. The deaths from tuberculosis were 7.3 per cent for Jews and 6.6 per cent for the general population. In the younger age groups, however, the proportion among Jews was considerably lower. In the 15–24 year group there were 25.0 per cent deaths among Jews in contrast with 31.6 per cent, and in the 25–44 year group, 18.8 per cent in

contrast with 22.3 per cent among the general population. The proportion of deaths from diabetes among Jews was more than double that for the general population, being 4.2 per cent and 1.7 per cent, respectively. In the age group 45-64 years deaths from diabetes were 9.3 per cent among Jews and represented almost one-tenth of the total deaths. Diseases of the digestive system were responsible among Jews for 6.1 per cent of all deaths.—J. V. De-Porte, Causes of Death among Jews in New York State (Exclusive of New York City), 1925, *New York State J. Med.*, 28: 1155-1159 (Oct. 1), 1928.

Health of London 1927—The population of the County of London in the middle of 1927 was estimated at 4,555,000 including 9,000 non-civilians. The births during the year were 73,263, giving a birth rate of 16.1 per 1,000, which is lower than for 1926 and 1925. Since 1921 the number of births has been decreasing at the rate of 4,000 annually. The deaths were 55,170 or 12.1 per 1,000. This rate is higher than in the two preceding years.

Five cases of smallpox occurred in the county, of which two were fatal. Three patients were unvaccinated at the time of infection, and 2 of these belonged to the fatal group. Up to December 31, 1927, a total of 115 children was dealt with at a special clinic for diphtheria carriers; 56 were able to return to school in less than 4 weeks, 32 in 4 to 8 weeks and 1 was under treatment for 19 weeks. The remainder were still under treatment. Deaths due to diarrhea were considerably below the average. The mortality from puerperal fever was much lower in boroughs with poorer class populations than in those occupied largely by the well-to-do. During the 5 years 1921-1925 the average annual death rate per 1,000 births was 0.88 for a poorer group of boroughs and 1.80 for a well-to-do group. In

1927 there were 267 notifications of puerperal fever and 892 of puerperal pyrexia. The deaths from cancer during 1927 were 6,774 with a death rate of 1.49, which is higher than in 1926 and 1925. The cancer mortality among women has been decreasing in London in the last ten years.—*Brit. M. J.*, 2: 448-449 (Sept. 8), 1928.

Population of Germany—The extremely low birth rate of the war years and the decline of the postwar period, together with the losses in able-bodied men, have materially changed the distribution of the various age groups in Germany. The excess of boys over girls in the first years of life is now even greater than it was before the war. According to the last prewar census there were 505 boys per 1,000 children under 1 year; in 1925 there were 509 per 1,000. The birth losses of the war period affected the census of 1925 almost exclusively in the 6 to 10 age groups. In the 7 and 8 year olds the numbers are not equal to 50 per cent of the prewar status. The 10 to 25 age groups were not markedly influenced by the effects of the war. The losses of men on the battlefields have produced in the age groups a marked excess of women over men. In the 25 to 30 group there was in 1925 an excess of 1,151 women over men as compared with 1,002 in 1910. The 30 to 35 group shows an excess of 1,260 in 1925 as contrasted with 1,001 in 1910. There are more adults and fewer children than before the war. In 1910, 33.9 per cent of the total population of the country was under 15 years of age; according to the census of 1925 only 25.7 per cent was under 15 years. In 1925 the number of children between the ages of 6 and 14 was about one-fourth less than in 1910. The number of minors in Germany is now 38.2 per cent of the total population, as compared with 45.3 per cent in 1910.

Since 1910 the number of unmarried men decreased 4.4 per cent while the number of unmarried women increased 0.2 per cent. The widowers have increased 12.7 per cent and the widows 21.7 per cent. Among women the increase is chiefly in the middle age groups. The number of divorced men has increased 119.2 per cent, and the women 120.6 per cent. This increase is especially noticeable in the younger age groups.—*J. A. M. A.*, 91: 977-978 (Sept. 29), 1928.

Vital Statistics of Germany for 1927—In the vital statistics of Germany for 1927, the increase in the number of marriages is especially significant. In 1926, there were 483,198 marriages contracted; for 1927, the number was 538,525, an increase of 11.5 per cent. This increase from 7.8 per 1,000 population, in 1913, to 8.5 per 1,000 in 1927 is all the more striking in view of the fact that the percentage of married men was already much higher than in the prewar period. The increase was especially marked in the large cities: Berlin, Hamburg, Bremen, and in certain provinces or states: Saxony (18 per cent), Upper Silesia, and Thuringia. The Prussian Bureau of Statistics ascribes the increase to the fact that the proportion of persons of marriageable age to the whole population was much greater than before the war. In 1910, Prussia, with a population of 40,000,000, had 22,300,000 above the age of 20, whereas, in 1925, with a population of 38,000,000, there were 24,200,000 above the age of 20. Unfortunately, in spite of the increase in the number of marriages, there was a decline in the number of births. If we note further that the number of women of childbearing age in the whole population is 2,700,000 greater than before the war, and that, in spite of that fact, the number of living births was decreased by about 445,000, the decrease in the number of

births appears even more significant. In Berlin, the birth rate has fallen from 19.4 (1913) to 10.6 (1927).

The total number of deaths in 1927 was 757,000, or 22,900 more than in 1926. The death rate in 1913 was 14.8; in 1927, 12.0. The increase of the mortality for 1927 over that of 1926 was due chiefly to the influenza epidemic of the first quarter and to the unfavorable weather conditions, especially during the last quarter of 1927. The infant mortality for 1927 shows a further decline. Owing to the drop in the birth rate and to the increase in the death rate, the net gain in population for 1927 was 90,000 less than for 1926. The excess of births over deaths (403,000) is only about half that of the prewar period.—*J. A. M. A.*, 91: 1208 (Oct. 20), 1928.

A Decline in Birth Rates in Japan—In recent years, the extraordinarily high birth rate of Japan has astonished the world. According to the records of the bureau of statistics, the numbers of births for the last half-century were: 1872, 57,000; 1883, 1,000,000; 1915, 1,500,000; 1920, 2,000,000; 1926, 2,100,000. The principal causes of the rapid rise of the birth rate after the Meiji restoration in 1868 were investigated and found to be as follows: (1) The people have married in order to have children; (2) the law has prohibited birth control, which was practiced in the Tokugawa era just before the restoration; (3) their marriages have not been contracted as early as in former times, when boys of 16 or 18 married girls as young as 13; (4) one of their principal foods is fish, which is thought to enforce the reproductive power; (5) venereal and other diseases which affect the nervous system have not been so frequent recently; (6) an income tax allowance has been made for the children, as in England.

The climax of the high birth rate

seems to have come in 1926, as the births in 1927 were 50,000 less than in 1926. At the same time the infant mortality rate has become higher than ever, owing to beriberi, tuberculosis and hereditary venereal disease. As a result, the Tokyo authorities are planning to investigate all births and miscarriages of women up to 40 years of age in the city.—*J. A. M. A.*, 91: 1205-6 (Oct. 20), 1928.

Vital Statistics of Singapore 1927

—The population of Singapore for the year 1927 was 428,153. The total number of deaths for the year was 14,165, and the death rate was 33.08 per 1,000 population compared with 32.04 in 1926 and 28.21 in 1925. The birth rate was the highest on record, being 33.05 per 1,000 in contrast with 31.52 in 1926 and 31.19 in 1925. There was an infant mortality rate of 228 per 1,000, the corresponding figure for 1926 being 232. The infant mortality rates ranged from 146 for Europeans to 219 for Chinese and 355 for Malays. Making corrections for Chinese emigration, the Chinese rate was about 181. Among the notifiable diseases there were 19 cases of smallpox and 7 deaths; 29 cases of diphtheria and 9 deaths; 2 deaths from whooping cough and 8 from measles; there were no scarlet fever cases. Tuberculosis caused 1,523 deaths and pneumonia 2,291, in contrast with 1,370 and 1,843, respectively, for 1926. The deaths from these two diseases constituted 25 per cent of the deaths from all causes. There were 272 deaths from heart dis-

ease during the year, and 606 from diarrhea and enteritis. Ninety-one deaths were due to puerperal causes, and 354 to accidents.—*Ann. Rep. Health Dept. Singapore for 1927.*

Decline of Vienna's Birth Rate in 1927—The recent report on the vital statistics of Austria for 1927 contained the following data: The number of marriages for the year was increased over that of the previous year, but in Vienna there was a decline from 17,791 to 16,257. The number of living births in Austria was 8,182 below the registration for 1926. The birth rate dropped from 19.7 per 1,000 to 18.3 per 1,000, whereas in 1913 the birth rate was 24.4. The mortality in 1927 was little different from that of 1926. In some of the provinces, especially in the rural districts, there was a slight decrease in mortality. The regions with the highest birth rates present also the highest mortality. The mortality of Vienna is somewhat lower than the average for Austria. The excess of births over deaths (for Austria as a whole) is falling rapidly. This is due to the decrease in the birth rate and the very slight increase in the death rate. In Vienna in 1927 there were 20,888 living births (in 1926, 22,223; in 1913, 37,632). This represents a decline of 40 per cent from the record for the last year before the war. The decrease in the population of Vienna for 1927 amounted to 5,574, whereas in 1916 the population remained unchanged and, in 1913, had shown an increase of 4,977.—*J. A. M. A.*, 91: 1050 (Oct. 6), 1928.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

Water Supply Contaminated through Bleeder Valves—Crisfield, Md., a fishing hamlet of approximately 4,000 people, situated in Somerset County on the Little Annemessex River, is supplied with water from drilled wells. It has no sanitary sewerage system and but one storm sewer. The topography is flat, the greatest elevation above mean sea level being between 7 and 8 feet. When analytical results of tap water samples indicated an "abrupt and serious deterioration" of the quality of the water supply, representatives of the Maryland State Department of Health made an investigation. A unique and interesting cause of contamination was revealed.

The first discovery was that an ice plant was returning condenser cooling water to the receiving basin of the city supply. An inspection of the condenser basin disclosed that it contained approximately an inch of sludge consisting of bird excreta. This condition was corrected by discharging the condenser cooling water into the river, but little improvement showed in the quality of the water supply.

Due to normally high ground-water elevation, the mains are inundated with tidal water. This condition together with the fact that there existed several leaks in mains (the town was receiving a revenue from only half the water pumped) indicated that whenever it became necessary to close valves on the mains, which was often done to allow the standpipe to fill, tidal waters entered the mains. A pitometer survey proving too costly, town employes uncovered the mains at odd times and repaired several leaks. This resulted in an improvement in the water in some

sections of the town but samples from oyster packing plants remained unchanged.

It was then found that in almost all packing houses there had been installed bleeder cut-offs to drain the piping above the ground to prevent freezing. This scheme resulted in the rise and fall of tidal water in the service connections between the bleeder cut-offs and the taps. When the cut-offs were changed to a position above the ground water elevation, permitting the pipes to drain but keeping ground water out of the system, satisfactory analytical results were obtained.

The investigators conclude that the repairs to the mains and the corrective change in the location of the bleeder cut-offs were the contributing factors toward obtaining a water of satisfactory quality.—Abstracted from a report of A. E. Goodrich, Div. Engr. Md. State Dept. of Health, dated Mar. 16, 1928, by J. L. Robertson, Jr. Asst. San. Engr., U. S. Public Health Service.

Properties of the Bactericidal Substance in Milk—Several workers have established the fact that fresh raw milk will inhibit for a time the growth of a variety of organisms. Many views have been advanced in explanation of this phenomenon. From the work done by the author and others, it is concluded that there exists in cow's milk a substance which is capable of restraining the growth of certain bacteria for definite periods. With the aim of obtaining more information about the principle, observations were made on: (1) The time of maximum concentration, (2) distribution in the quarters of the udder, (3) reactivation, (4) filtrability,

(5) effect of absorbents, and (6) effect of desiccation. From these observations the following conclusions were reached: The substance is present in the colostrum and milk of the first few days of lactation as well as later. Its concentration varies in the secretion from various quarters of the same cow. Its activity is diminished by heat and cannot be restored again by the addition of active milk. The principle is present in whey and readily passes through the coarsest Berkefeld filter although a considerable portion is retained by N candles. The finest filter (W) completely retains it. It is absorbed by animal charcoal but not by kaolin, kieselguhr, or bolus alba. It can be desiccated and its presence has been demonstrated in one brand of dried milk.—F. S. Jones, *J. Exper. Med.*, 47, 6: 877-888 (June), 1928. Abstr. P. R. Carter.

Ship Fumigation Determined by Observed Rodent Infestation—Report is made of work done to determine if fumigation of vessels need be done in all cases since some vessels may be free from rats. The authors made a study of 100 vessels and concluded that a careful inspection to determine the number of rats present was practicable. A routine procedure was established, after which fumigation was practiced only where inspection showed the need. As a consequence the following conclusions were drawn: (1) More efficient application of regulations regarding fumigation—When agents request extension of routine fumigation period, compliance can be based on the known absence of rats. (2) More efficient fumigation of vessels—Knowledge of the whereabouts of rats and their approximate numbers stimulates fumigators to more diligent effort. (3) Avoidance of expense and delay of shipping by avoiding unnecessary fumigation. (4) Conservation of effort, equipment and material of quarantine station without relaxing essential pre-

cautions against dangerous vessels. (5) Reduction in fumigating personnel through elimination of unnecessary fumigations. (6) Definite stimulation of rat proofing of vessels and encouragement of trapping and other rat eradication measures by steamship agencies striving to obviate cost of fumigation and attendant delay.—C. V. Akin and G. C. Sherrard, *Pub. Health Rep.*, Reprint 1149: 861-867 (Apr.), 1927. Abstr. H. B. Foote.

The Disposal of Effluents from Beet Sugar Factories—

The waste disposal problems which confront so many industries present particular difficulties and burdens to the beet sugar industry. The manufacture of beet sugar being limited to about three months of the year throws a heavier charge on the cost of production for a given capital expenditure than is the case in industries which are employed throughout the year. This consideration assumes especial importance in view of the large quantities of water used and waste produced in the manufacture of beet sugar.

The location of beet sugar factories in agricultural districts and on streams of comparative purity renders any contamination of the stream more noticeable and more significant than that which is caused by factories situated in industrial areas in the neighborhood of streams which have already reached a high degree of pollution.

During the early part of the period for which the sugar factory is working, the flow of many streams is low and this may require greater storage facilities for the effluent or a higher degree of purity. The lower temperatures at this time of the year also affect adversely the activity of bacteria and the efficiency of biological methods of purification. In extreme cases, where a stream is frozen over, further difficulties are introduced since it has been shown that in such cases the dissolved oxygen content of an unpolluted stream may fall to as low as 40 per cent of saturation.

Four different wastes are produced by beet sugar factories. Beet carrying and washing water, amounting to about 2 m.g. per 1,000 tons of beets treated daily, is the least objectionable, containing some suspended mineral matter and ordinarily but 20 to 50 p.p.m. sugar, and having an oxygen consumed

value of about 340 p.p.m. This is treated successfully by plain sedimentation for 6 to 8 hours, and by precipitation with lime.

Diffuser battery and pulp press waters, together amounting to 300,000 gals. per 1,000 tons of beets, are more objectionable and more difficult to treat. Combined, these carry 0.6 to 0.8 per cent of sugar and an equal amount of other organic matter. Among methods used with some success in treating these are: Addition of lime followed by carbonation, with or without the mixing in of beet carrying and washing water; plain sedimentation and land irrigation; septic tanks with or without the use of lime; contact beds; trickling filters; fermentation with or without lime to neutralize the butyric acid formed; and activated sludge. Each process has definite limitations.

Filter press lime sludge is readily disposed of by application to land, preferably treated previously with quicklime.

Steffens waste water, the production of which is limited to the United States, is quite objectionable, having an oxygen consuming power of 3,000 p.p.m. and containing all the mineral salts of the beets which may be toxic to fish.—A. J. V. Underwood, *Indust. Chem. & Chem. Manuf.*, 3, 29: 260–265 (June), 1927. Abstr. D. E. Kepner.

Refuse Dumps—The cause of odor from refuse dumps is due either to the decomposition or the burning of organic matter contained in the refuse. The obvious remedy therefore would be to thoroughly separate all garbage and other organic matter for disposal in other ways, such as hog feeding, incineration, or the recovery of the grease and tankage as marketable products.

Separation of garbage from other refuse is commonly practiced and if effectively carried out will be a considerable help in reducing the odor at dumps, but there is certain to remain more or less

organic material adhering to boxes, paper, etc., in the shape of rags, bedding, and the like, or else as garbage that has failed of separation. This material decomposes in the dump during warm weather or catches fire with the ashes, rubbish and the unburned coal and is thus the source of the offensive and far-reaching odors in question. These are a common nuisance in the outskirts of most large cities, depreciating property values and causing general discomfort. They may be carried by the wind under favorable conditions for a distance of several miles. Their complete elimination under ordinary conditions—physical and political—found in most cities is not believed to be practicable.

The following four measures combined with effective separation of other refuse from the ashes will go far to reduce the odor at dumps:

1. All material should be covered with earth without delay. This is the most important measure to be applied.

2. As much as possible of the combustible rubbish (boxes, crates, paper, cartons, etc.) should be burned by itself (preferably in a suitable incinerator) and the dump confined to well-burned ashes.

3. The exposed face of the dump should be held to the least possible area by dumping at the margin of the fill only and carrying it to the full height, keeping the face covered with earth.

4. Fires should be extinguished at once and not left to smoulder. This can be best done by maintaining a constant water supply reaching all parts of the dump for quenching, but where the dump is too small to warrant the expense necessary for this, much can be done by smothering with sand or earth before the fire extends itself. When once started and after reaching into the body of the dump, such smouldering fires are difficult to extinguish.

Experience has indicated the great difficulty in preventing dumps from becoming nuisances. In addition to odor, there are the objections of the scattering of paper and other light material by the wind and the breeding of vermin and flies. If their use is unavoidable they should be placed in locations remote

from habitations.—Abstracted from a letter prepared by Kenneth Allen, Chairman of Committee on Collection and Disposal of Refuse, Public Health Engineering Section.

Sewage-Polluted Surface Waters as a Source of Water Supply—The suitability of sewage polluted bodies of surface water as a source of water supply is dependent on several factors, including: (a) The character and extent of their pollution, (b) the location of sources of pollution with respect to sources of water supply, (c) the degree of protection to these sources afforded by natural agencies, such as dilution and self-purification, (d) the extent of further purification afforded by artificial water purification, and (e) the practicability and economy of supplementary artificial measures for reinforcing, where necessary, the protection afforded by water purification.

The effects of pollution of sources of water supply are modified by bacterial changes occurring in sewage, by seasonal influences, by dilution and self-purification. In any appraisal of conditions of pollution surrounding a given source of water supply, account also should be taken of the relative sizes of the population groups jointly responsible for such conditions and of their respective locations, on a time-distance basis, with respect to that source.

The average well designed and operated rapid sand filtration plant, aided by chlorination, can produce consistently a final effluent meeting the revised Treasury Department Standard from river waters of the Ohio type hav-

ing an average *B. coli* index not exceeding 5,000 per 100 c.c. For Great Lakes water, the corresponding limit appears to be less than 2,000 per 100 c.c.

Among the supplementary measures currently practiced or proposed for reinforcing existing water purification processes are: (a) long-time storage, (b) double-stage coagulation, sedimentation and filtration, and (c) raw water pre-chlorination.

The total cost of water purification in the United States ranges from 40 cents to \$1.40 per capita annually. Although the cost of sewage treatment may range as low as 40 to 95 cents per capita annually, the extra cost of intercepting sewers, where necessary, may increase the total cost of this measure by from \$1 to \$10 per capita. Exclusive of intercepting sewers, the per capita costs of water purification and of sewage treatment appear to be nearly equal.—H. W. Streeter, *Pub. Health Rep.*, 43, 24: 1498-1522 (June), 1928. Abstr. O. C. Hopkins.

AN OMISSION

In the July issue of the Journal, page 933, appeared an abstract of "Comparison of the Temperature and Bacterial Count of Milk and Foam during certain Stages of the Pasteurization Process." The names of two of the collaborators were inadvertently omitted: C. S. Leete of the Bureau of Dairy Industry, U. S. Dept. of Agriculture, and Prof. L. F. Miller of the University of Minnesota. The abstract carried only the names of H. W. Whittaker and R. W. Archibald, Minnesota Dept. of Health, as authors.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

FIFTH INTERNATIONAL MEDICAL CONGRESS ON INDUSTRIAL ACCIDENTS AND OCCUPATIONAL DISEASES, BUDAPEST

September 2-7, 1928

THE Budapest Meeting of the Fifth International Medical Congress on Industrial Accidents and Occupational Diseases began with a huge reception Sunday night, September 2, 1928, in the Hotel St. Gellert facing the Danube, where the assembling delegates and guests were presented to the officials, both of the Congress and of the Hungarian Government. An accompanying exhibition on industrial safety and welfare was also opened for the week in the Institute and Museum of Social Hygiene by Dr. Joseph Vass, the Royal Hungarian Minister for Public Welfare and Labour. The magnitude of this Congress may be appreciated when we are shown a list of the 2,400 who had registered prior to the first day. The meeting of the International Permanent Committee was held at 9 A.M. Monday in the Academy of Science, centrally located in the city, which building was the headquarters for general assemblages, the secretaries, etc. The address of welcome of Dr. Vass, who is a member of the Catholic clergy, on behalf of the Hungarian Government, was entirely in Latin. At this first meeting the assembly hall and gallery were completely filled with people. Plenary sessions were held Monday afternoon and Tuesday morning, while the sectional meetings began Tuesday afternoon and were continuous, mornings and afternoons, to and including Thursday.

The program was printed in five lan-

guages—Hungarian, German, French, Italian and English; however, the different speakers presented their papers, as a rule, in their native languages. One had opportunity to meet in person many foreign notables in the field such as Dr. Tibor de Verebely, leading Hungarian surgeon and the President of the Congress, Professor William de Friedrich, Vice-President, and Dr. George Gortway, Secretary, and many whose names have been familiar for years. While it may be said that the stress of the sessions was surgical in nature, or, more properly on orthopedic surgery, the meetings were divided into three groups: industrial accidents, industrial hygiene, and general industrial welfare, each having morning and afternoon sessions throughout the period.

Possibly 75 were in attendance from America, the chief party being led by Dr. Fred H. Albee and Dr. Richard Kovacs, President and Secretary, respectively, of the Physician Travel Study Club of America. The names of the Americans on the program, in addition to these two, were Drs. D. Shapiro, Harry C. W. S. de Brun, E. Gidding, E. L. Fisk, Raphael Levy, O. Glogau, New York, N. Y.; Dr. Prather, U. S. Public Health Service, representing Dr. R. R. Sayers and W. P. Yant, Washington, D. C.; Dr. Henry H. Kessler, Newark, N. J.; Dr. R. M. Carter, Green Bay, Wis.; Dr. Orenstein who, while coming from Johannesburg, is really

American; and Dr. Emery R. Hayhurst, Columbus, O.

The sessions on Industrial Hygiene were held in the Institute for Industrial and Social Hygiene, a 6-story building located some distance from the Academy, while those on surgery were held at Dr. Verebely's Clinic, also some distance, but these necessary sorties to meeting places were welcomed as interludes in the intensity of the program. The industrial hygiene papers were mostly upon specific topics such as the diagnosis of lead poisoning, silicosis, fatigue and industrial physiology, rheumatism, neuroses, heart diseases, the special senses, asbestosis, halogen poisons, the hazards of certain trades and poisons, ankylostomiasis, anthrax mercury, pneumokoniosis, brass founder's ague, skin afflictions, syphilis, trauma and others.

A daily bulletin ranging from 15 to 31 pages, printed in five languages, was a convenient feature; also abstracts of all papers were mimeographed and ready for distribution the day following presentation, while an alphabetical directory of all those in attendance, who were registered prior to the meeting, was distributed the first day, likewise an Index Praelectorum of the 176 who presented papers. An unusually complete messenger service kept guests continually notified at their respective hotels of special entertainments and privileges.

Elaborate entertainment was furnished guests in the nature of steamer tours on the Danube, a gala dinner by the government at the Hotel St. Gellert, special receptions to the members of the International Permanent Committee, an evening for all guests in Angöl Park (located on the Island), and a final farewell banquet by the Municipality of Budapest, also at the St. Gellert Hotel.

A diagram of seats was made for all banquets and each was notified in advance of his or his party's table. The entertainment for ladies was especially elaborate, as our wives testified. Additional excursions to the country were also arranged on Friday and Saturday at the end of the week as well as opportunities to visit industries in and about Budapest. Many of the social and excursion events were gratis. The Americans likewise were entertained by Mr. Wright, the American Ambassador to Hungary, with a 5 o'clock tea on Wednesday at his residence.

The transactions of the Congress will be anticipated with eagerness.

The official delegates from the United States were Dr. Fred H. Albee, New York, N. Y., Dr. Francis D. Donoghue, Boston, Mass., Dr. Emery R. Hayhurst, Columbus, O., Dr. Francis D. Patterson, Philadelphia, Pa., and Dr. D. J. Prather, U. S. Public Health Service (all present). EMERY R. HAYHURST

DUBLIN CONGRESS OF THE ROYAL INSTITUTE OF PUBLIC HEALTH

August 14-20, 1928

WE arrived at this Congress early Tuesday morning, August 14, 1928, and registered at headquarters in The Mansion House, two blocks from our hotel, where we met Dr. T. N. Kelynack, the Secretary, and were introduced to Colonel Sir William R.

Smith, Senior Vice-President and Principal, and Lady Smith. These remained especially solicitous for our welfare throughout the meetings. There were several places to visit in connection with the Congress and we accordingly placed our names on the large

cards hung up for that purpose at headquarters.

The Congress opened with an official reception given by the government at 9 P.M. Tuesday, in The Rotunda of The Mansion House, which was profusely decorated with flags and flowers. It was attended by President William T. Cosgrave and Mrs. Cosgrave of the Irish Free State, and General Richard Mulcahy, T.D., President Designate of The Congress and Minister for Local Government and Public Health, whose wife was in charge of the Ladies' Committee. There were fully 1,000 present at this reception.

The Inaugural Meeting of the Congress took place in The Rotunda of The Mansion House at 11 A.M. Wednesday, where members appeared in their official or academic regalia, including badges and other honors, and formed a procession to their seats, while many of the delegates from foreign countries were assigned seats upon the stage with the officials and guests of the Congress. Telegrams were sent to, and replies later received from H.M. The King, Patron, and H.R.H. The Prince of Wales, Vice-Patron of the Royal Institute. The proceedings were opened by Thomas Murphy, Chief City Commissioner of Dublin, followed by the Rev. Dr. Westrop Roberts, Vice-Provost of Trinity College, Dr. D. J. Coffrey, President of the National University College, Dublin, Dr. W. A. Winter, President of The Royal College of Physicians, Ireland, Dr. T. E. Gordon, President of The Royal College of Surgeons, Ireland, Dr. E. Magennis, President of the Apothecaries' Hall of Ireland, and Sir Thomas Oliver, Vice-Chancellor of The University of Durham, and Chairman of the Council of The Institute. A number of overseas delegates addressed the meeting, representing Australia, South Australia, India, the Settlement of Shanghai, and Switzerland, and the writer spoke a few

words as a delegate from some American institutions. The next meeting place was announced as Zurich, Switzerland.

A luncheon was then extended to the members of the Congress by the Messrs. Arthur Guinness, Son & Co., under the chairmanship of Sir John Ramsden, its Chief Medical Officer, and followed by a trip through the enormous establishment.

We took the Peamount Sanatorium trip, 12 miles from Dublin, in the afternoon where several hundred tuberculous children are being treated according to the most modern methods, under the auspices of the Marchioness of Aberdeen and Temair, who has actively sponsored anti-tuberculosis work for years in Ireland. Other trips also were arranged for that day—to the Cappagh Open Air Hospital for Crippled Children, Newcastle Sanatorium, and one to the Crooksling Municipal Sanatorium, all located a few miles away from Dublin. We likewise greatly enjoyed the visit to Trinity College the latter part of that afternoon. For the evening, tickets were provided to the Irish National Theater for one of the finest plays we have seen—one characteristic of Irish life, and by an Irish troupe—"Professor Tim" (by George Shiels).

Sectional meetings began Wednesday afternoon, and continued during the meeting with long morning hours (9:30 to 1:00) and short afternoon hours (2:30 to 4:00).

Section I of the Congress was devoted to State Medicine and presided over by Registrar General E. P. McCarron and Sir William Milligan, there being 13 papers listed under its general sessions. The three sub-sections were (1) Municipal, County and Port Sanitation, under Dr. E. F. Stephenson and Alderman William Muirhead; (2) Epidemiology, under Sir John Moore, Dr. Thomas H. C. Stevenson, and Dr. Matthew J. Russel, with 10 papers, and (3) Housing of the Working Classes, and

Town Planning, under Dr. C. W. Dwyer and Professor L. Patrick Abercrombie, with 7 papers.

The trend of papers on State Medicine concerned malignancy, administrative public health matters, alcoholism, nervous diseases, industrial hygiene, milk, town planning, and small house construction.

Section II was on Bacteriology, Pathology and Biochemistry, and presided over by Dr. W. D. O'Kelly and Dr. James M. Beattie, with 8 papers, concerning research and various bacterial diseases.

Section III was on Maternity and Child Welfare, and School Medical Inspection, and presided over by Dr. J. A. Harbison and Professor A. Louise McIlroy, with 23 papers, concerning midwifery, social hygiene, and child and natal hygiene in various phases.

Section IV, on Production and Control of Milk and Food, was presided over by Professor J. F. Craig and Dr. Gerald Leighton, with 10 papers upon the questions of safe food supply, parasites, "wholesome milk," butter and margarine.

Section V, on Tuberculosis, was presided over by Sir William J. Thompson and Dr. P. C. Varrier-Jones, with 15 papers touching upon the prevention, sanatorium treatment, and education of tuberculous patients, and an interesting address upon the "Humor and Pathos of a Tuberculous Campaign," by the Marchioness of Aberdeen and Temair, also a couple of fine films upon the Papworth Village Settlement where perhaps 1,000 tuberculous workers with their families are self-supporting.

The scientific meetings closed with the Friday morning sessions.

Thursday noon a luncheon was given in the Royal Hibernian Hotel to some 80 persons connected with the Congress

by The Right Hon., The Viscount Leverhulme. That afternoon visits were made by the women to certain municipal undertakings and housing schemes in Dublin while a sectional meeting was in session. The latter part of the afternoon we visited University College. On Thursday evening the Congress Banquet was held in The Mansion House, some 500 guests being present, and the chair presided over by Sir Thomas Oliver with short addresses by a number of prominent persons in health, official and religious circles. Among others was His Grace, The Most Rev. The Archbishop of Dublin, who proposed the toast of The Royal Institute of Public Health in a stirring address which was responded to by Col. Sir William Smith, who referred especially to the origin and subsequent progress of the Institute.

At the Garden Party at The Vice Regal Lodge given by Governor General and Mrs. James McNeil, at 4 P.M. Friday, there were some 1,200 persons present. Following the formal introductory program, the seven Americans present were again introduced by Sir William J. Thompson, Honorary Secretary of the Congress.

On the Saturday and Sunday following, excursions were arranged, even to distant parts of Ireland. Also on Sunday some of the delegates attended the morning services at St. Patrick's Cathedral.

The final meeting of the Congress was held at 9 A.M. Monday in The Mansion House, where universal satisfaction and appreciation of the Dublin arrangements were formally declared. We, however, left early Saturday morning for a trip to Killarney Lakes, Cork, and Blarney Castle.

EMERY R. HAYHURST

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Recent Food Infections—This editorial discusses an outbreak of enteric fever, 90 cases being under treatment in London hospitals on August 14. The symptoms were mild with no vomiting and diarrhea but constipation with many manifestations of rose spots. Two cases were severe and 1 death was reported at Epsom. The organism held responsible was *B. paratyphosus B*, presumably distributed in food. Cream is under suspicion and the view is held by some that the withdrawal of the permission to use boric acid preservative is responsible. It is contended that this is unlikely since cream is produced from milk and permission to use boric acid in milk has not been a fact since 1912. It is further pointed out that the public has confused the paratyphoid outbreak with cases of food poisoning and that the rapid onset, accompanied by vomiting and diarrhea and frequent prostration indicative of food poisoning, is in marked contrast with the slow and mild development of the symptoms caused by *B. paratyphosus B*. All of these causative agents, however, are similar in that they belong to the Salmonella group of organisms. In England the *B. paratyphosus A* organism does not occur, C is occasionally found but the B type is common.—*Lancet*, 2: 334 (Aug. 18), 1928.

Rickets in Rats—Comparisons of Effects of Irradiated Ergosterol and Cod Liver Oil—Rats fed on Sherman diet B, when 28 days old were placed on Steenbock and Black's high calcium-low phosphorus diet 2,965 plus 10 per cent lard. This diet contained 1.07 per cent calcium and 0.178 per cent phos-

phorus. The rats were kept on this diet for 21 days, after which 2 per cent of the lard was replaced by cod liver oil, or irradiated ergosterol in olive oil, both being given separately and not mixed with the diet. The amount of ergosterol given was equivalent to 0.01 mg. per rat per day. After 14 days the animals were killed and autopsies showed intramuscular hemorrhages in 2 of the rats receiving ergosterol. The animals, studied as to (1) blood serum analyses, (2) histological examination of the bones, (3) bone analyses and (4) metabolism of calcium and phosphorus, showed that marked cure of rickets in rats is secured in 2 weeks by cod liver oil and by 0.01 mg. daily of irradiated ergosterol. The cure is accomplished without great increase in the retention of calcium or phosphorus as is shown by metabolism studies. Histologically the bones show substantially the same condition with the cod liver oil as with the ergosterol supplement.—Alfred T. Shohl, Helen B. Bennett and Katharine L. Weed, *Proc. Soc. Exper. Biol. & Med.*, 25: 551 (Apr.), 1928.

Acid Drinks and Enamelled Vessels—This article discusses a report by the assistant medical officer of health for Newcastle-upon-Tyne of an outbreak of poisoning following the consumption of an ice drink prepared in an enamelled vessel. The firm desiring to provide a refreshing beverage for its employees during a hot spell undertook to make "lemonade," the acid ingredient of which was tartaric acid. This was dissolved in hot water in enamelled buckets purchased for the purpose, the rather concentrated acid solution remaining in

the buckets over night. It was found that the enamel on these buckets had been attacked so that it could be removed with the finger. The enamel on these pails contained antimony oxide equivalent to 5 per cent of the metallic antimony. Antimony was also found in the "lemonade" taken from the pails to the extent of 0.013 per cent metallic antimony. This amount, according to the medical investigator, is equivalent to 1.52 gr. of tartar emetic in a 10 oz. tumbler; so that drinking one-third of a tumbler might be expected to result in definite symptoms. No other heavy metals being found in the beverage, the conclusion is drawn that the poisoning was due entirely to the antimony. Further comment is made that the buckets used for this purpose were not intended for food purposes by the manufacturer and that in those circumstances the enamel is so adjusted that ordinary acid solutions used in the household will not remove appreciable amounts of the glaze. It is suggested that containers of such character should be sufficiently labeled that they will not be used for food or drink purposes and that such outbreaks be given publicity for warning purposes.—*Lancet*, 2: 337 (Aug. 18), 1928.

A Bacteriological Study of Salad Dressing—A bacteriological examination is reported of 15 brands of mayonnaise, 12 of other salad dressings, 6 of olive mayonnaise, and 6 of olive relish. With the exception of a few samples of homemade mayonnaise only commercial products were studied, and the condition of all of the samples was good when the cans were opened. Of the entire number of cans, only 4 were found to contain anaerobes, and these were non-toxic. The number of aerobic organisms varied from 0 to 17,400 per c.c. The largest percentage of sterile cans was found among the salad dressings other than mayonnaise. These con-

tained a starch paste, and it is thought that the heat used in preparing the paste and the acidity of the product were the chief facts contributing to sterility. The most probable source of contamination is considered to be the egg yolks. From 12 cans, sporeforming rods with morphological and cultural characteristics similar to *B. subtilis* and *B. mesentericus* were isolated. *B. coli communior* when introduced in broth cultures into the various foods disappeared rapidly. *B. subtilis* remained viable for a longer period of time.—F. M. Bachmann, *Wis. Acad. Sci. Arts and Letters, Trans.*, 23: 529-537, 1927. *Abstr. Exper. Sta. Rec.*, 59: 488 (Oct.), 1928.

Growth and Reproduction on White Bread with Various Supplements—The rations used in this experiment contained 70 per cent or more of bread made from high grade patent flour. In order to get representative results 3 kinds of bread were used—a commercial bread containing some milk, as well as lard, sugar, salt and yeast; and two specially prepared and containing the same amounts of yeast but one made with water and the other fluid milk. Rats 28 days old were placed on this experimental ration. Six series of experiments were conducted using for supplements whole milk at two different levels, egg, carrot, spinach, almond and lean beef. Charts are given showing the growth curves on the different diets. On a diet of dried bread 70 per cent and dried whole milk 30 per cent, there were normal growth, good health and reproduction. Similar results were obtained with dried bread 70 per cent and dried egg powder 30 per cent, 4 females bearing 68 young, 12 of which were placed on the diet of the mother rats at 28 days. Half made normal gain for 3 to 6 months, but the remainder showed signs of general weakness, nasal hemorrhages and rickets and

3 died within 6 weeks. Results with bread 90 per cent and milk 10 per cent were similar to bread 70 per cent and carrot 30 per cent. Growth was poorer than with egg or 30 per cent milk. Neither the bread and almond nor the bread and spinach diet was able to maintain the animals in health. The poorest records were made with bread and lean beef. No marked differences were shown between the kinds of bread used, and the best results were obtained on bread 70 per cent and milk 30 per cent, and on bread 70 per cent and egg 30 per cent.—Mary Swartz Rose and Grace MacLeod, *J. Nutrition*, 1: 29 (Sept.), 1928.

The Calcium of Cheese—An experiment was conducted to determine whether commercial cottage cheese, "a sour milk cheese," is really lower in calcium than other common cheeses—the rennet cheeses. The cheeses used were three different samples of colored American Cheddar, one white American Cheddar, three domestic Swiss, and one imported Swiss, two Dixie cottage cheese, and three of Borden's cottage cheese. The calcium was determined by the Shohl modification (*J. Biol. Chem.*, 50: 527–536, 1922) of the McCrudden method, precipitating the calcium from solution of ash as oxalate at pH 4.8 to 5.2, igniting and weighing as calcium oxide. It was found that the two rennet cheeses, Swiss and Cheddar, have approximately 14 and 9 times as much calcium as the cottage. The calcium is not only higher in the rennet cheeses but higher in proportion to the protein—for every 100 gm. of protein there are 3.37 gm. in the Swiss, 2.83 gm. in the Cheddar and 0.62 gm. in the cottage cheeses.

Cottage cheese, therefore, is a poor source of calcium and not a rich one as usually considered.—Katharine Blunt and Emma Sumner, *J. Home Econ.*, 10: 587 (Aug.), 1928.

Nutritive Value of Haddock and Herring—Young growing rats 21 to 25 days old and 40 to 50 gm. in weight were used in this experiment. The haddock was bought in small amounts in the open market and after being freed from the head and viscera was made into meal which contained many small bones. The herring was also made into meal which contained a small amount of bone material. Samples of the herring and haddock were analyzed for content of fat, nitrogen, moisture, ash, Ca and P. The herring and haddock were fed in a series of diets, each kind being fed alone and then in diets variously supplemented. Charts are given showing the rate of growth for the animals. When fed haddock alone and with the addition of salts, the animals developed ophthalmia, indicating a low vitamin A content. With the addition of vitamin A in the form of butterfat the animals improved rapidly for a short time, but after 2 months the animals died. Death was due to vitamin B deficiency, since it was found that the addition of 3 per cent yeast prolonged life. Herring free from bone contains sufficient vitamin A to prevent xerophthalmia but was found deficient in minerals and vitamin B. Herring proteins at the levels of 9 and 15 per cent were not adequate for the well-being of the second generation. Tables are given showing the supplementary value of fish proteins for cereal, legume seed and liver proteins. Herring and haddock were found to be poor supplements for the proteins of navy beans and peas, haddock being the better of the two. Both fish proteins have a supplementary value for the proteins of oats and wheat, herring having a higher value than haddock. The supplementary value of herring compares favorably with that of steak, liver and kidney and is higher than that of haddock.—M. C. Kik and E. V. McCollum, *Am. J. Hyg.*, 8: 671 (Sept.), 1928

Commercial Acidophilus Products

—The investigation reported which was concerned with laboratory analyses alone is intended to throw some light on a number of commercial acidophilus products which might be expected to have therapeutic value. Eight such products were included in the investigation: 7 of these were milk and the 8th was a broth culture. By plating on whey agar, casein digest agar, meat infusion agar, and in the case of one product, tomato extract agar, and by incubating the plates at 37° C. for 3 days in air and in an atmosphere of 5 to 10 per cent carbon dioxide gas, the numbers of viable microorganisms were ascertained. Whether these organisms were *B. acidophilus* of strains known to have therapeutic value was determined by comparing their reactions in various sugar media with those of a stock laboratory strain of proven therapeutic value.

As a confirmatory test the critical surface tension in dynes was determined for each strain isolated. Five of the products examined were prepared in the East and were examined very soon after manufacture. Three products were obtained from the West and were shipped to New York City by air mail.

It was found that the broth culture which purported to be *B. acidophilus* was *B. bulgaricus*, and the maximum number of viable organisms was 40,000,000 per c.c. Of the 7 milk products examined 5 bore information on the label as to the number of viable organisms claimed. Of these 5 products only 2 fulfilled these claims as to numbers present, and in both cases the cultural reactions of the strain of *B. acidophilus* present were not identical with those of the stock laboratory strain, and were consequently considered

by the investigators to be of doubtful therapeutic value. Three products were found to contain one-half or less than one-half the numbers claimed, and in 2 of these products the organisms present differed from the stock laboratory strain of *B. acidophilus*. One product examined contained authentic *B. acidophilus*, the maximum number found being 57,000,000 per c.c. The label of this product bore no claims as to numbers. One product, the label of which bore no claims as to numbers, contained a maximum of 170,000,000 organisms per c.c. These organisms were identical with the stock laboratory strain.

It is pointed out by the authors that at present there is no definite figure known for the minimum number of viable acidophilus bacilli requisite for therapeutic results. Attention is directed to the need for scientific experimentation to establish such a standard.

In the experience of the authors a daily dose of 1 quart of acidophilus milk containing not less than 100,000,000 organisms per c.c. is necessary to alleviate severe chronic constipation or acute diarrhea within 2 weeks. They add that a lesser number of viable organisms ingested for a longer period of time may be, in all probability, beneficial. It is recommended that the labels of all acidophilus products bear the following information:

- (a) Date of manufacture
 - (b) Minimum number of viable organisms (*B. acidophilus*) at date of manufacture
 - (c) Minimum number of viable organisms (*B. acidophilus*) at time of earliest possible sale under normal conditions
 - (d) Date of expiration
 - (e) Minimum number of viable organisms (*B. acidophilus*) at date of expiration
 - (f) Type of *B. acidophilus* predominating—
- N. Kopeloff, P. Cohen and P. Beerman,
J. A. M. A., 91: 1187 (Oct. 20), 1928.

CHILD HYGIENE*

MERRILL E. CHAMPION, M. D.

Studies on Infant Mortality—West coast cities have for some time had a lower infant mortality rate than eastern and southern cities, chiefly because in the race for health all cities do not start from the same base line. This is the conclusion of Dorothy Holland, Ph.D., and George T. Palmer, D.P.H., in a paper given before the American Child Health Association.

One of the first steps in finding out why one section of the country should be uniformly successful in preserving infant lives is to discover how the cities with low rates differ from the cities with high rates, Dr. Holland points out. Do the weather records show more sunshine in the low rate cities? do they have less poverty? or are they better instructed in health matters? Sunshine, temperature and other weather facts for each city are to be found in weather records. Census reports likewise give data on the amount of illiteracy; economic status is measured by the number of unskilled workers, nationality, etc.

Dr. Holland was able to secure the statistics for about twenty-five different influences which are believed to have a bearing on infant mortality. By mathematical means the importance of these was tested for approximately 100 cities for the years 1921 to 1925.

The peculiar features of the cities with low infant mortality were that they had relatively little rainfall, practically no illiteracy, and were of a relatively high economic status, as indicated by small percentages of unskilled workers and low percentages of negro popula-

tion. The proportion of total foreign population did not exercise a marked influence one way or the other although the cities with a generous sprinkling of Scandinavians usually had low baby death rates.

From the relationships thus disclosed it was then possible to predict mathematically what a city's rate would be after making due allowance for these various favorable and unfavorable influences.

While the method worked out is experimental and deserves further study, Dr. Holland is hopeful that it will eventually be of material assistance to the public health profession in determining what rates can be expected of a city considering its external health advantages and disadvantages. The city with natural handicaps will not be expected to achieve the record of another with natural advantages unless very great effort is exerted. On the other hand, the favored city will have less excuse for a high infant death rate.

When fully worked out the table of predicted rates will reveal what cities have rates higher than the predicted rates and what cities have lower rates. This information itself will be of the greatest value as a basis for further search to find the causes responsible for the deviation of these cities from the expected rates.

The Place of Sickness Records in the School Health Program—"The results of a 4-year study of the illnesses among school children of Hagerstown, Md., seem to show that younger children suffer illness slightly more frequently than older children, and girls

*The abstracts for this month deal with papers given before the American Child Health Association on the occasion of its joint session in October with the American Public Health Association in Chicago.

more frequently than boys," according to Selwyn D. Collins, Ph.D., Associate Statistician, U. S. Public Health Service.

Respiratory diseases caused 46 per cent of all the illnesses occurring in the 4-year period, or an average of slightly more than 1 respiratory attack per child per year. Of the 16,475 respiratory attacks, 66 per cent were reported simply as colds, 21 per cent as tonsillitis or sore throat, and 10 per cent as influenza or grippe. "Sore throat" and "grippe" were the more frequent names used in the last two groups. Most of the influenza and grippe occurred in two outbreaks which attained their peaks in March, 1922, and February, 1923, respectively.

Next in frequency to the respiratory diseases comes headache and third is "biliousness" and similar terms. Fourth in the list come the communicable diseases, including measles, mumps, whooping cough, chicken pox, scarlet fever and diphtheria.

Public health and school officials are very active in the prevention of communicable diseases but are doing little or nothing about the greater problem of the respiratory diseases, except those relating to the tonsils. The size of the respiratory problem or the absence of any solution for it, however, is not confined to the school but is true among industrial workers and the general population.

Colds are very frequent at 6 years of age but decline to a minimum at 11 years of age or not much more than half the rate at 6 years. After 11 years, the rate rises slightly. Influenza and grippe are reported more frequently among the older than among the younger children. Tonsillitis and sore throat are relatively low at 6 years, rising to a maximum at 11 years, after which the curve declines considerably. The curve for headache is somewhat similar to the tonsillitis and sore throat

curve, its peak coming at 12 years of age.

Digestive disturbances increase slightly with age, the maximum coming at about 12 years, after which there is a slight decline. Toothache rises to a maximum frequency at 9 years with a tendency toward a very slight decline thereafter.

Accidents rise to a peak at 12 years of age. Automobile and other street accidents would probably be more frequent among the younger children but the data here classified as accidents include many minor injuries such as a sore finger, hurt possibly in playing ball, and other such minor conditions.

While the relation of sickness to many physical defects was not gone into, there have been collected considerable data on sickness from certain causes in relation to the condition of the tonsils. Tonsillitis and sore throat, of course, show the largest differences in the sickness rate, the rate for the children with removed tonsils being less than half that for children with defective tonsils. Colds are also slightly more frequent among children with defective tonsils than among the other two groups.

Sickness and Absence Records in the School Health Program—Is it worth while in the promotion of the health of America's children for schools to keep sickness absence records? O. B. Nesbit, M.D., Director of Medical Inspection of the public schools of Gary, Ind., believes that keeping such records is immensely valuable. Gary has the distinction of being the only city in the United States where a health program with a full-time medical officer has been a part of the school curriculum from the very first development of the school system.

The school nurse makes out a personal history record card when a pupil enters the school, and files this for a

working record. Dr. Nesbit says: "These data are available for transfer to the health record card." The school nurse also sees and examines any pupils or school employes taken ill at school and "excuses" them if in her judgment such persons should go home.

The nurse "excludes" from school any pupil suffering from communicable diseases, vermin, parasitic skin diseases, etc., upon direction of the school physician. The nurse may readmit "head" cases, and skin troubles, at will. She readmits chicken pox, smallpox, diphtheria and scarlet fever cases only on permit from the city health department, measles after 2 weeks, and whooping cough after 4 weeks.

In the 4 years during which the school has been attempting immunization against smallpox, scarlet fever and diphtheria, 1924 to 1928, there has been a decided drop in the number of cases and also in the number of days lost.

During the past 10 years, 1,688 cases have been excluded from school. It would seem a worth while service to remove these cases from association with well children, but contact out of school was probably very little restricted except in the quarantined cases.

Result of the National Congress of Parents and Teachers 1927 Summer Round-up of Preschool Children—Discussing the Summer Round-up of preschool children, as it is being pushed by the National Congress of Parents and Teachers, Máry E. Murphy, of the Elizabeth McCormick Memorial Fund of Chicago, stated that continuous medical supervision of the child from

birth to school age and the instruction of all parents in child care is the goal.

"From a group of 102 local associations in 22 states taking part in 1925, the movement has grown until, during the year 1927, 2,120 groups representing local communities in 44 states participated. Among the 448 associations which met all the requirements of the round-up there were 13,768 children examined. Among these, 17,857 defects were found of which 6,262 were corrected, or over one-third.

"Thirty associations secured the correction of more than 75 per cent of the defects discovered. Of these, 5 scored 100 per cent, while 9 passed the 90 per cent mark. Seventy-nine associations made a record of between 75 per cent and 50 per cent. Of these associations all met the requirements of a spring and fall examination and an official report to the National headquarters.

"The slogan with which the movement was launched, 'Let Parent Pride Put Parent Power to Work,' expresses tersely its real significance. It is built upon a common interest of men and women organized around the school for the benefit of the children in the school and the community. With a sense of responsibility which the home should assume as its share in the common project of home and school, the parents of the local associations have striven to send to school an entering class of children physically prepared.

"This great organization with its 20,000 units representing every economic level provides a strategic avenue of education into more than a million homes."

PUBLIC HEALTH NURSING

MIRIAM AMES, R. N.

MENTAL HYGIENE AS A PART OF PUBLIC HEALTH NURSING

The October number of *The Public Health Nurse* is devoted largely to a discussion of the meaning and place of mental hygiene in public health nursing. Several urban public health nursing associations have already incorporated mental hygiene in their programs, trying out various methods of administering this phase of their work and educating the workers.

Dr. George K. Pratt, in a leading editorial, speaks of the strategic position of the public health nurse for detection of mental and emotional difficulties in early stages. The nurse who is trained in knowledge of mental conditions acquires an "increased understanding of the true nature and sources of her personal problems. Such personal understanding is, in turn, followed by a clearer comprehension of her patient's difficulties, with a consequent increase in her efficiency as a nurse."

Mental Hygiene Commentaries

Mental hygiene is not something new and alien which is added to hygiene; it is hygiene adequately conceived. Mental nursing is merely nursing adequately conceived. . . . The physician and nurse who are in contact with the infant after the departure of the obstetrician have an opportunity not only of seeing that the child gets the right formula and puts on weight at the recognized speed, but of supervising the general training of the child with regard to the first tests of its adaptation to the new world.

In regard to many school pupils, problems will come up that are not merely pedagogic problems, and the question is whether these will be handled in a summary, disciplinary way or whether they will be studied adequately and intensively by one who has been specially prepared for this sphere of work. This latter means that the school physician

and the school nurse shall have comprehensive training in the field of nervous and mental disorders and be familiar with the problems that are raised by difficulties in the instinctive and in the emotional life.

Interest in work, satisfaction from successful functioning and from due recognition, an understanding of the rôle which the individual worker plays in the general industrial machine, the absence of a feeling of injustice or grievance, these are a few of the factors which favor the mental health of the individual worker. In some plants while efficiency is assured by means of vocational tests and job specifications, by the use of production charts, by attention to problems of fatigue, and to need of change, at the same time the health and happiness are guarded by the social assimilation of the incoming worker, by definite friendly advances of chosen fellow workers, by some explanation of the rôle of the individual worker in the general industrial machine, by kindly contact with the home, if necessary, through industrial nurse or social worker. Industry, primarily interested in efficiency, may come to be one of the great cultural influences.—C. Macfie Campbell, M.D., *The Prevention of Mental and Nervous Disorders, Canada Lancet.*

The public health nurse must learn to distinguish between modifiable and unmodifiable human material. This is a distinction which doctor and nurse and social worker and teacher must learn to make, and they learn it through the painful method of trial and error in daily experience. Until we learn this lesson, we shall waste a great deal of energy and expose ourselves to ideas of inferiority and attitudes of depression. This point of view may seem heartless. Yet experience has shown that attempting to force a person to believe what he doesn't want to believe is futile. The harvest of human distress is great and the reapers are too few. As such it is an absolute necessity for us to conserve our energies for activities in which there is some opportunity for accomplishment.

You who come in contact so intimately with these gnawing problems of human lives, I would urge to work upon such common needs of mental hygiene. If in your own mind talking with a psychiatrist is synony-

mous with a charge of insanity, your clients will feel the same way. If you allow yourself to yield to the facetiousness that expresses itself in "I guess I'll go and have my head examined," you may stand in the way of someone who needs our helpfulness. The persuasion of someone to go to the right physician and talk things over is not a task, if you yourself understand the nature of the mind, and its expression in behavior. There are few of us who do not need to recover from mind shyness. The word psychology is a commonplace in our conversation, but it usually refers to the psychology of the other fellow. It is one thing to take courses of study and do reading on Instinct and Habit; it is another to recognize emotional mismanagement in ourselves that causes us to be physically ailing, or bitter and cynical, or petulant and over-critical.

From what I have seen of the nurse in training, and the nurse in public health, I believe that she is not only competent to understand and use these principles dealing with the relation of behavior to health, but I feel that her work is seriously handicapped by a lack of training in this branch of medical science. To make possible such practical experience for you who go out to bear the burden and heat of the day should be one of the greatest causes to which nursing education can direct its energy.—Esther Loring Richards, M.D., *The Meaning of Individual Adaptation in the Field of Health*, Shumway Memorial Lecture of the Visiting Nurse Association of Chicago.

One of the serious dangers at present is that we shall neglect all traits except intelligence, and regard a child as a tall or short intellect mounted on legs. We speak of "mental age" and "mental ability" when what we mean is intelligence age and intelligence ability. There are many kinds of mental ability, such as ability to control one's self, or to appreciate art, or learn arithmetic. Intelligence is but one of them, and by no means always the most important.

If we are going to "send the whole child to school," let us observe the whole child, even if we cannot measure each fraction of him accurately. And let us plan for the mental health of the whole personality rather than for only a portion of that personality.

Planning for mental health would also lead us to place a heavy emphasis, more than is yet common in our schools, on self-mastery, and on the acquisition of those emotional social qualities which, though of lesser value, perhaps, in dealing with the material environment, are so necessary in making human contacts.—Daniel Wolford La Rue, *Mental Hy-*

giene in Curriculum Making, The Nation's Schools.

Public Health Nurse, XX, 10 (Oct.), 1928.

Diphtheria is Still Declining—

Since 1900, a decline in the death rate from diphtheria has been noted in the 10 states of the original registration area. The decline was rapid at first but, around 1915 and 1920, it became more gradual. In 1922, a further drop to about 8 deaths per 100,000 population occurred with such suddenness that it seemed necessary to account for it by some new factor; perhaps partly improved medical and nursing care, undoubtedly partly the use of antitoxin immediately upon diagnosis of the disease.

No corresponding drop in the number of cases of diphtheria was noted until after 1922. It was about this time that toxin-antitoxin was introduced and adopted rather generally, and there seems adequate ground for feeling that the use of this immunizing serum has materially affected the incidence of the disease.

It is somewhat disturbing to advocates of the toxin-antitoxin treatments to find that during 1927 and 1928 the number of deaths and the number of cases have both been on the increase again. There are two ways of accounting for this. Not all the susceptible individuals have been immunized in spite of the accepted effectiveness of toxin-antitoxin; so it is quite possible for the disease to develop among this untreated group. Also by study of diphtheria records for the past 30 years, it is found that the disease has occurred in waves, reaching the peak of greatest prevalence about every 7 years.

The increase of 1927 and 1928 is in direct accord with the preceding pattern of incidence. However, since it started from a much lower level, there is little

doubt that the peak will be much lower than in any preceding period.

Experience teaches us that as a disease comes under more complete control, its endemic prevalence reaches lower and lower levels and its epidemic waves grow smaller and smaller until it becomes a "rare" disease. If the battle against diphtheria is continued without faltering, by use of the weapons at our command we can confidently expect this result in the course of the next generation.—

Edgar Sydenstricker, Is Diphtheria Still Declining?, *Survey*, LXI, 2: 77 (Oct. 15), 1928.

Light Therapy—In these days when ultra-violet light is in danger of becoming the latest fad, we are grateful for definite facts about its value and its limitations. Dr. Winthrop M. Phelps tells about the various forms of light therapy in an extremely interesting article.

"Light" itself is to be considered as "a constant stream of radiation or waves which constitute the electromagnetic spectrum." These waves vary in length from crest to crest, and the form of light produced depends on the wave length. At one extreme are the very long ones which are known to us as radio waves; the next shorter are heat waves, then the visible color rays; shorter than the color rays are the invisible ultra-violet or X-rays, and shortest of all the rays from radium.

Most light sources produce varying combinations of the visible and invisible rays, but we are conscious only of those portions which produce immediate sensory reactions, such as heat or color. Except for the radio waves, all have a certain effect upon growth and health, the ordinary light waves being so constantly a part of our environment that we are unconscious of their significance to our well-being.

The therapeutic value of the heat or infra-red rays and ultra-violet rays is the chief subject of discussion in this paper. Concentrated heat rays, by

means of reflected electric light bulbs or more complicated apparatus, are used to improve circulation locally by vasodilation, to produce muscular relaxation, and to give certain analgesic effects in pain.

Ultra-violet rays are produced in connection with most visible light but, because of the fact that they do not penetrate ordinary glass, their value is lost from such sources as electric light bulbs. A quartz container will allow effective radiation of the ultra-violet rays. Although body burns due to over-exposure to ultra-violet rays are not usually serious, the sensitiveness of the eyes is so great that they should always be protected by a shield while the treatment with ultra-violet rays is being given.

The knowledge of the positive value of ultra-violet rays in specific disease conditions is at present not extensive. Rickets is unquestionably helped, and the best source of the desirable rays for treatment of rickets is a fresh mercury-vapor arc enclosed in a quartz tube.

The ultra-violet rays do not penetrate the skin deeply; so they are of little value in direct concentration over diseased areas lying in the deeper tissues. The general exposure of the body surface to the rays, however, seems to speed the recovery no matter where the underlying pathology is. Certain skin conditions are improved by ultra-violet rays, but others seem to be made worse. Ultra-violet light does have a definite effect of improving muscle tone. Most other attempts to improve diseased conditions by this means have shown no positive results.

There has been much discussion, pro and con, as to the value of ultra-violet light in the treatment of tuberculosis. It is generally accepted that the light rays as combined in sunlight are more effective in the treatment of tuberculosis than any concentrated artificial light rays. The nearest artificial approach

to whole sunlight is the "white-flame carbon arc." It requires no glass cover, but it must be produced through special heavy electric wiring in order to contain all the rays necessary. It is considered useful in institutions or offices for treatment of bone or glandular tuberculosis but impractical for use in the home. Certain disadvantageous effects of the white-flame carbon arc have been noted in cases of pulmonary tuberculosis, so that on the whole the mercury-vapor arc is at present considered a safer substitute for real sunlight for such cases.

Emphasis is placed on the need for being sure that the apparatus is actually in condition to give the desired results, whether it is a plain electric light for heat waves, mercury-vapor arc for ultra-violet light, or white-flame carbon for the whole spectrum.—William M. Phelps, M.D., *Light Therapy*, *Am. J. Nurs.*, XXVIII, 9: 875 (Sept.), 1928.

The Changing Status of Health Publicity—In the last thirty years the total amount of sickness and death has been decreased by one-third, due almost entirely to such specific measures as sanitation, quarantine, and immunization—the reduction occurring in such diseases as typhoid, diphtheria and smallpox. It still remains to find measures which will reduce sickness and death from cancer, heart disease, and common colds.

In very early days health regulations were considered a part of the religious code, and so were easily enforced. Quarantine and inoculation against smallpox were enforced through legal enactment. But with the beginning of the last century, and the awakening to the problem of tuberculosis, police power was found ineffective, and a

health education program began to develop. It is through the education of mothers that infant mortality has been so far reduced.

However, organized education in the laws of personal hygiene must be supplemented by personal instruction of individuals and by periodic health examinations. The principal objectives of a health education campaign are summarized by Dr. Hiscock as "first, the avoidance of external conditions dangerous to life, as accidents and germ diseases; second, the development . . . of artificial immunity through . . . sera and vaccines; third, the inculcation of the principles of hygiene; fourth, the development of the conception of preventive medicine, through the employment of physicians for early diagnosis . . . and guidance in the application of laws of healthful living. . . ."

There are innumerable media of publicity by which the people can be reached—the press, radio, movies, exhibits, public addresses. The material used for such publications must be authentic, interesting, stimulating, simply expressed, and timely.

Many fields offer excellent opportunity for study and publicity of results—social hygiene, cancer, heart disease, tuberculosis, child health. Much has already been published, but there is still much left to be done in acquainting the public with methods of reducing sickness and preserving life. It has been estimated that if existing knowledge of measures for health promotion were generally applied, at least ten years could be added to the average life span.—Ira V. Hiscock, *The Changing Status of Causes of Death and Sickness, from the Publicity Standpoint*, *Proceedings of the National Conference of Social Work*, 1928. C. E.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

What Does the Public Think about It?—Syracuse is on the way to trying some form of evaluation of health education material. The discussion which follows appeared in the October–November issue of *News Bulletin* of the Committee on Publicity Methods. Since so many JOURNAL readers are interested it seems fair to reprint it in full.

We have been considering for some time, in Syracuse, the possibilities of evaluating some of our publicity and are somewhat puzzled as to just how to proceed.

Over a year ago we tried an "Ask Me Another" contest over the radio to see how valuable that avenue of health education was, finding it rather successful.

We are not so much concerned with what the public thinks of our material, as suggested on page 10 of your September *Bulletin*, as we are with the educational value of the message we give. We believe, of course, that the more attractive the method of presenting the message the better is the chance of having its contents fully absorbed by the public. To that extent we are interested in what people think about our stuff. Our proposed plan is to circularize by mail perhaps 1,000 citizens, asking certain questions on health, then tabulating their answers. After this has been done we would distribute a street car card answering the questions previously asked and about two weeks after that circularize another 1,000 persons with the same questions and compare the results of the two groups. In such an effort we would, of course, attempt to avoid all newspaper items on the subject, as well as radio talks.

Having thus possibly obtained the increased knowledge caused by the car card, we would try the same principle with newspaper articles, omitting all radio talks and posters. It is our belief that having done this by three or four methods, such as car cards, posters, radios and newspapers, we would be able to decide which

offers us the best opportunity of presenting our health messages.—

James J. Stone, Onondaga Health Association.

Then a statistician comments on the above:

I am very much interested in Mr. Stone's proposal. It seems to me the project would be both useful and practicable.

There are several *variables* involved in the problem, of which the important ones are:

a—the medium

b—the quality of the material

c—the sample of persons exposed to the material

To conduct the experiment ideally, it would be necessary to vary the medium used while holding the other two variables constant, but it is obviously impossible to use the same material a second time on the same group of people. Accordingly, the sample would have to be changed, but it would be desirable to have a sample as closely similar as possible for each repetition of the experiment. The samples should be similar both with respect to the kind of people included and in respect to their preparation for the test. I wonder if, even though the attempt to avoid newspaper discussion of the experiment were successful, repetition of the experiment in the same city would not find a second sample of people somewhat affected by the first experiment.

I think the best method of making this test might be to try out each of the media considered (car cards, posters, radio and newspapers) in different but similar communities simultaneously. It would be possible to select four samples of 1,000 people in similar communities which would probably be as nearly alike as four samples selected successively in one community, and this plan would permit the use of the same material with each of the four media, or at least much more nearly the same material than would be possible if the experiment were repeated four times in the same community.

There would be considerable expense in making the experiment even once; \$40 for postage, for example, in using a sample of 1,000 people, to say nothing of other expenses. The study seems to me to have possibilities

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

and I think it might be worth the extra expense involved in making it in four places rather than in Syracuse alone.—

Ralph G. Hurlin, Russell Sage Foundation.

We Cannot Make It Too Simple

—By writing one's name and address on a slip of paper (or business card) and adding a designated number, a copy of one of a number of valuable publications will be supplied free to any one who visits Education-Publicity Headquarters at an Annual Meeting. But at Chicago 20 persons turned in slips with no number to indicate what was wanted—and the editor is not a mind reader.

Since the address slips or cards are sent to the respective publishers it is especially important that but a single number be placed on a single card. But it took more than half a day from other work to copy the addresses of people who failed to observe this request at Chicago. And neither mailing clerks nor postal clerks could read some of the addresses given.

Twice recently when we used some of this free material in meetings it was explained that always some people fail to hear the instructions—and in both those meetings several people failed to hear what was explained in detail. We cannot be too careful in giving instructions or information to be used by other people.

What Do You Want?—Really and truly what kind of information and other material would you like to have appear in this department? more about appeal letters and printed matter used in connection with money raising? more definite suggestions and examples in the preparation of health education folders? or are you most concerned with newspaper articles?—and so on—what do you really wish?

Are the school health workers reading this department for more references

to printed matter, ideas and discussions of classroom activities?

Is there any one who makes any use of the "Titles," or "Slogans and Phrases"?

If you do not find what you most want in this department, please tell the editor, for it is quite possible your wishes can be met if they are made known.

If what does appear in the department is of little interest or use to you, please say so. It will not take many objectors to relieve the pages of the excess baggage.

But it is up to you.

In the Other Half of the World—

The statement in the paragraphs below are so familiar that they are worth quoting only as an illustration of how similar the health education methods are in this distant part of the world to those here. One difference is that the English use the word propaganda to mean propaganda, while here we use it to mean bad propaganda.

Many of the leading provincial and local newspapers gave due publicity to the reports of Baby and Health Weeks Celebration held at different places. A series of four articles . . . were published in practically all the English and vernacular newspapers in July and August last. The articles sought to prove by laying emphasis with the help of statistical information on the great part played by many preventable diseases in intensifying poverty; the causes of these diseases and the methods of their prevention were then explained in brief. . . .

The proceedings of the Public Health, Maternity and Infant Welfare Conference and the Exhibition arranged by the Association in August last in Poona, India, were given wide publicity in the press. In November last a public appeal for funds was issued to the press, giving a brief interim report of the work of the association, mentioning the various ways in which the association offers material assistance in the celebration of Mofussil Baby and Health Weeks. This appeal also appeared in many provincial and local vernacular papers. Lady Cowasji Jehangir (Junior) arranged a series of six talks on Infant Welfare to be broadcast from the studio of the Indian

Broadcasting Company and Lady Cowasji herself and Dr. Tilak broadcast two talks in the series in December last.—

Report of the Bombay Presidency Baby and Health Week Association, 1927.

A Meeting That Did Not "Just Grow"—The steps taken in planning the meeting at Chicago to discuss "Steps in Planning a Year-Round Program of Health Education" illustrate the procedure followed in the careful preparation of one type of program.

Mrs. Routzahn and Dr. Galdston were a committee of two to arrange the meeting and, in consultation with other members of the Section Council, they selected topics and speakers. The participants accepted their assignments from three to five months in advance of the meeting. Each received an explanation of the purposes of the program and of his own part in it.

Abstracts or complete papers were sent to the chairman a month before the convention. These were duplicated and sent to each speaker, together with comments and suggested changes, to avoid overlapping and to fill in some of the gaps. Several papers were considerably revised as a result of this exchange between speakers. The psychologist, who was unfamiliar with the field of health education, received a collection of health booklets and folders and a brief account of the interests of the persons likely to make up the audience.

This is a simplified account of the steps taken. Some of the speakers were interviewed and numerous letters passed between the speakers and the chairmen, and much conference and correspondence preceded the selection of the speakers.

The examples of actual education-publicity programs which were discussed critically at the meeting were obtained by inviting readers of this department of the JOURNAL to submit programs which answered a list of questions about objectives, audiences, subject matter,

method of approach, choice of methods and time schedule. Mimeographed copies of this request were mailed to about 100 health workers. Many of these carried a pencilled note from the chairman which probably helped in securing attention for the impersonal form letter. About 40 replies were received, including 22 programs which were used. Of these, 14 were displayed at the headquarters of the Section, and 8 were used for discussion. All of the 8 selected generously responded to a request that they supply 500 mimeographed copies. These copies were sent direct to the convention headquarters and were assembled there in sets and placed in envelopes by volunteers for distribution at Education-Publicity Headquarters and at the meetings.

Window and Other Exhibits—A memorandum on window exhibits prepared by the editor of this department applies largely to fair and exposition exhibits. Here is the memorandum as distributed by the Philadelphia Welfare Federation:

Subject matter of a window exhibit: Something that is important to tell the public *which can also be made interesting and intelligible in graphic form.*

A live or moving display must *usually* be one which can be put on all through the business day—and the evening as well.

Whatever else you do, be interesting—don't risk being dull or stupid.

The display must appeal to the "general public," not to the staff, board members or the friends of those who plan the display.

Crude or rough forms can be used only if done artistically—home made exhibits must not look "home made."

All placards should be worked out most carefully—as to wording—capitalization and punctuation—kind of letter—size and spacing of letters—color of card and lettering—position in

window and manner of display—if on floor to have stiff backing and solid easel to hold to correct angle without being leaned against something—being sure that every word can be read easily and quickly from the outer edge of sidewalk.

Be very, very sure to study windows—and your window—so that you may think in terms of actual conditions—and not merely of so many feet one way and so many another with a sheet of glass in front.

In a *good window*: simplicity; unity; unusual appearance.

In a *bad window*: small pictures; small lettering; too little space—between lines—between letters; too low.

To *dodge attention and interest*: Crowding—too many objects—too many words—too many ideas—too close together; messiness—too many different shapes—and materials and pieces; crudity—in workmanship—dolls not life-like—bad art—flimsy looking structures—looks too “home made”; tapes or ribbons—confusing and distracting; detailed maps—except on a quiet street for unhurried passerby; lists; groups of photographs.

To *get attention*: striking color; movement; large size; three dimensions; an idea related to interests of the passerby (the man on the street); an idea that can be quickly grasped; a treatment which does not seem trivial and casual; use of the human figure as well as of things.

Among the possibilities in materials and other features to use are the following:

Backgrounds—novelty papers; crepe papers; draped materials—usually plain vertical; painted background; wall paper; scenic effect—street—skyline—camp surroundings; row of large silhouetted figures; large scale outline

sketches; large blackboard (extended horizontally)—may have imitation of school blackboard decorations.

Mechanical devices—automatic stereopticon; automatic picture display; continuous motion picture; open book with turning pages; moving belts; colored lights; opening and closing doors; revolving platform; moving figures.

Objects—massed quantities—as soap or bread used in one year—or figures in swimming suits to show how many have learned to swim; hand work (be sure to bring out its significance); equipment for hospital, playground, etc. (mildly interesting); models (if buildings—add cutouts of people to give life).

Dramatic forms—tableaux; marionettes or puppets; demonstrations; pantomime; interpreters—to point to objects and placards—to place placards—to write on blackboard.

Physical forms—cutout photos; cutout silhouettes; outline sketches; enlarged cartoons; *much* enlarged photographs; any of above as transparencies; heavily mounted and cutout letters; outline maps—with great discretion; picture maps—ditto; posters—more so; “little theatre” form—be sure to have action in scene staged; diagrams—rows of silhouettes—rows of objects—flashing lights—heavily mounted cutouts—strips of wood or colored paper—tall cylinders (possibly with cutout silhouettes or photographs on the front).

Helps and helpers: Make a “census of useful people”; get an artist as adviser on color and general effect; a good amateur photographer may work out silhouettes; a manual training teacher may handle cutouts; an official in a factory may get interested in working out a moving device and may provide motor for same; groups of women may cut out pictures not mounted on wood.

LAW AND LEGISLATION

JAMES A. TOBEY, LL. B., DR. P. H.

Pass the Parker Bill—A vigorous resolution urging Congress to pass the Parker Bill for federal health coordination over the veto of the President was adopted by the Association at its 57th Annual Meeting in Chicago in October, 1928. The second session of the Seventieth Congress convenes December 3, 1928, and will adjourn March 3, 1929. The time for action is short, but there is time enough for this desirable procedure.

The principles of the Parker Bill have been indorsed by the American Public Health Association every year since 1925, and Congress finally adopted the measure, somewhat amended, in May, 1928. Apparently due to the influence of General H. M. Lord, Director of the Budget, President Coolidge vetoed the bill on May 18, giving as reasons the fact that one section was considered unconstitutional and that the bill tended to "militarize" the U. S. Public Health Service.

The palpable fallacies of these arguments have already been discussed in this department. Though the Parker Bill by the amendments lost a certain effectiveness, it is still a very important measure, especially in its provisions for allowing the detail of U. S. Public Health Service personnel to other government bureaus; in granting a commissioned status to sanitary engineers and other scientific personnel of the service; in providing for a Nurse Corps; and in setting up a national advisory health council.

Sanitarians are still interested in this excellent measure and keenly desirous that it be passed now. If it is not, the bill must be reintroduced and passed all

over again in the next Congress. It would be helpful if sanitarians would communicate with their United States Senators and Representatives regarding this important matter. Do it now.

Traveling Expenses and Income Taxes—At last the somewhat muddled matter of travel expenses and federal income taxes of physicians seems to be getting more or less settled. On October 2, 1928, the U. S. Board of Tax Appeals ruled in *Jack v. Commissioner of Internal Revenue* that the amounts expended by a physician for railroad fare, hotel accommodations and meals in connection with attending meetings and conventions of various medical associations could be deducted as ordinary and necessary expenses in computing income tax returns.

This decision does not become final until 6 months after its promulgation, during which time the Commissioner may appeal to the courts if he so desires. It is to be hoped that he will not, for this decision and a previous one, *A. Silverman*, 6 B.T.A. 1528, in which a chemist was allowed to deduct traveling expenses in attending a professional society meeting, would seem to be sufficient precedent for authorizing members of the American Public Health Association who pay their own expenses to professional meetings to deduct such expenses in figuring their income taxes, if they are affluent enough to have any.

Applications for refunds for previous years, a separate application for each year, may be filed now with the Commissioner of Internal Revenue, using *Form 843*, and showing thereon that the application is based on *Jack v. Commis-*

sioner of Internal Revenue, Docket Nos. 14995 and 17662. The *Journal of the American Medical Association* in an editorial on this matter in its issue of October 27, 1928, estimates that the medical profession has paid as much as half a million dollars into the federal treasury for these taxes since 1922, when the Commissioner first denied the deductions. This *Journal* is, as usual, somewhat sarcastic about it, and properly so in this case.

More Liability for Typhoid—Still another court decision sustaining an award of damages for typhoid fever caused by impure water has joined the number of cases which have been discussed recently in this department. Municipal and private corporations ought by now to be cognizant of the fact that it does not pay to be careless in supplying water to the people. Water companies seem to be paying dearly for the knowledge that they owe a duty to the public to exercise reasonable care to see that water furnished for human consumption is pure, potable, and free from contamination.

The latest decision comes from California and represents an opinion in 19 cases brought against a city for deaths and illnesses due to a polluted municipal water supply, *Ritterbusch v. City of Pittsburg*, 269 Pac. 930. The facts were that a chlorination plant used to treat the city water became inoperative for 12 hours in June, 1920, and unchlorinated water was supplied to the city. The result was an epidemic of typhoid and dysentery.

The California Supreme Court upheld judgments against the city awarded by lower courts on the ground that the evidence was sufficiently conclusive to show that the epidemic was due to the negligence of the city in failing to treat the water properly. Once more public health is advanced by the courts. Other court decisions on this same subject

have been collected and discussed by the Associate Editor, who will send a reprint on the subject to anyone who wants it.

A BIBLIOGRAPHY OF PUBLIC HEALTH LAW

For the benefit of sanitarians there is presented herewith a list of references to the more important articles, bulletins, and books on various phases of public health law which have appeared during the past 2 years. All significant material which was published prior to that time is cited in the book *Public Health Law*.

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Lapp, J. A., and Ketcham, D. *Hospital Law*. Bruce, 1926.

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Tobey, J. A. Court Decisions on Pasteurization, *Reprint No. 1168*, 1927, U. S. P. H. S.

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Fowler, W. Court Decisions Relating to Public Health, *Supplement No. 56*, 1926, U. S. P. H. S.

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STREAM POLLUTION

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Tobey, J. A. A Manual of Tuberculosis Legislation. National Tuberculosis Association, New York, 1928.

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Mendelsohn, I. W. Responsibility of Interstate Common Carriers in Supplying Safe Drinking Water to Passengers and Crew, *Pub. Health Rep.*, Apr. 1, 1927.

Tobey, J. A. Liability for Water-Borne Typhoid, *Pub. Works*, Apr., 1928.

VACCINATION

Fowler, W. Smallpox Vaccination Laws, Regulations and Court Decisions, *Supplement No. 60*, 1927, U. S. P. H. S.

VITAL STATISTICS

Fales, W. T., Kopf, E. W., and Tobey, J. A. Constitutional, Statutory, and Administrative Aspects of Vital Statistics, *A. J. P. H.*, Aug., 1927.

We Bow Ourselves Out—With this issue the writer has completed 9 years' service as editorial assistant and associate editor of the *AMERICAN JOURNAL OF PUBLIC HEALTH*. His tenure of office has been longer than that of any other member of the present Editorial Board, except Dr. E. R. Hayhurst.

Due to increasing demands on his time, lack of sympathy with the policies of the present chairman of the Editorial Board, and other reasons, the writer regrets to state that he considers it desirable to relinquish the pleasant, if somewhat arduous, duty of conducting

this monthly department on Law and Legislation.

Although the *JOURNAL* carried an anonymously conducted section on "Legal Decisions" in 1916, the first systematic attempt to present reports on public health legislation was inaugurated in 1920, when the writer's material assembled for the National Health Council was incorporated regularly in the *JOURNAL*. In March, 1923, this legislative material was placed in a separate department, which has been continued up to now, though with increasing and broadening scope. In recognition of this advance, the name of the department was changed to Law and Legislation in 1925.

During his 9 years of service the writer has contributed about 250,000 words to the *JOURNAL*, chiefly in his own department, though occasionally in news items and editorials.

That the material on Law and Legislation has been profitable not only to the writer but also to the readers seems indicated by the numerous communications which have been received commenting on various items or requesting information on legal topics. Only once during the entire period has anyone taken issue with anything that has been said in this department, though no doubt there have been plenty of provocative statements, all of which, however, the writer has been willing and able to support.

The legal side of public health is one of the most important subjects which confront the health official. For his own protection, as well as for his efficiency as an administrator, he should have an adequate working knowledge of public health law. It has been the writer's privilege to contribute something to that knowledge in the past through this department and in other ways, and he expects to continue his interest in that subject.

BOOKS AND REPORTS

A Short History of Medicine, Introducing Medical Principles to Students and Non-Medical Readers—By Charles Singer, M.D., D.Litt. Oxford. New York: Oxford University Press, 1928. 368 pp. Price, \$3.00.

The name of the author and the press from which this book comes are sufficient to assure one of its quality. Examination of the contents further convinces the critic that his confidence has not been misplaced.

Dr. Singer assumes that medical science has now reached such a stage that some knowledge of it is demanded of all educated men and women whether or not they have had medical training. He supports the historical method of teaching.

The outstanding aim of the work is to lay stress on the principles of medicine rather than the details of practice; to treat medicine as a science rather than to give the histories of individuals, though this feature has not been neglected. The term "philosophy" is frequently substituted for "principles," and this term is explained in the preface as standing for the "disinterested study of the theory of the subject, without reference to its application to particular instances."

Beginning with an illuminating picture of Greek medicine, in which our debt to those early times is shown, we are carried as rapidly as possible through the schools described as "The Heirs of Greece," those of the Middle Ages down to modern medicine, to which more than half of the book is devoted, the writer presenting it "as a natural outgrowth of an ancient tradition."

The author dates the beginning of modern medicine, which he calls the

"Period of Scientific Subdivision," at about 1825. After a brief discussion of the causes for this scientific specialization, he begins with the study of preventive medicine in England and in this country, and in sequence considers those lines of thought which have brought medicine to its present state. We find the history of the cellular theory of pathology, the germ theory of disease, anesthesia, advances in surgery, bacteriology as a special science, immunity, psychology, nursing, physiology, and studies of the special senses discussed.

In view of the author's object—to teach students and non-medical persons the history of the science of medicine—he has given his account in language as simple as possible so as to make the smallest demand upon the scientific equipment of his readers. He has, however, avoided the very common mistake made by writers of more or less popular books of taking as his target the mental age of about ten.

It is unusual to find a book designed for such a wide range of readers so well balanced. Not only can the historian, but the average medical man, as well as the layman, find here the knowledge which he seeks, presented in clear language and orderly sequence.

The book closes with an epilogue which is somewhat philosophical in character, though its application is practical. The debt which medicine owes to the various sciences is emphasized, and we are urged to encourage the study of science as a whole, or of learning as a whole, rather than to make a "direct attack" on medicine, which has been one of the mistakes of the past. It is pointed out that medicine "cannot give immortality, but it should enable us

all to live out our full lives. Death, coming in due and not undue time, is shorn of all his terrors, when every man and every woman

Shall come to his grave in a full age,
Like as a shock of corn cometh in, in his season."

The printing and make-up of the book are excellent, and there are many unusually good illustrations.

M. P. RAVENEL

The Glands Regulating Personality

—By Louis Berman, M.D. (2d. ed. rev.) New York: Macmillan, 1928. 341 pp. Price, \$3.50.

There is no doubt that one of the most interesting as well as important problems before the physiologist and practitioner is that of the secretions of the ductless glands and their effect upon the body and its functions.

The author of the present book conceives that every person is dominated by his internal secretions, and he uses the terms "pituico-centric," "thymo-centric," "gonado-centric," "pituico-adrenal," etc., to designate persons who are chiefly influenced by one gland or combination of glands, giving descriptions of the types which may be expected from the action of one gland or the other. In order to prove his case, he analyzes the characters of a number of historic personages such as Napoleon, Nietzsche, Darwin, Caesar, Oscar Wilde and others, whose peculiarities as well as genius are attributed to the particular internal secretions which dominated them. Finally, there are chapters on Applications and Possibilities, and Evolution, in which he goes so far as to indicate that endocrine hygiene may control crime and improve the race, since "A man's chief gift to his children is his internal secretion composition."

The author is evidently widely read, and he interweaves facts with his fantastic theories so skilfully as almost to deceive the elect. This book may serve to amuse those who are well posted on

the subject of endocrinology. We believe it to be distinctly dangerous and misleading to anyone who has not a sound fundamental education. As an example, we know that the first edition was ordered by the School of Education of a certain university—not by those in the Medical School, who would not have been misled.

Needless to say it contains a great deal that is true; but this is so interwoven with theory and imagination that one must sound a note of warning concerning its fallacies. M. P. RAVENEL

Nurses, Patients and Pocketbooks—

A report of the Committee on the Grading of Nursing Schools—
By May Ayres Burgess. New York: Committee on the Grading of Nursing Schools, 1928. 618 pp. Price, \$2.00.

This valuable study presents the results of a comprehensive survey of the nursing profession. The first part presents the facts brought out by the research, while the second discusses their implications. Some of the chapter headings, indicating the general nature of the facts gathered, are:

Is there unemployment now?
What registrars say.
Is there a public health nurse shortage?
Are physicians satisfied?
Are patients satisfied?
How do nurses like their jobs?

Perhaps the outstanding conclusion of the committee relates to the supply of nurses, for statistics indicate that there is a decided over-production. If present trends continue, this over-production will produce a serious situation. Other general facts ascertained are: there is no dearth of applicants for public health nursing positions, but there are not sufficient applications by well-qualified candidates; physicians prefer registered to practical nurses, but cannot always get the type of nurse desired for unpopular varieties of cases; the incomes of most private duty nurses are

low, half earning \$1,297 or less a year; the competition of "practicals" seriously affects the incomes of R.N.'s; the quality of many R.N.'s is distinctly below that required by physicians and the public; practical nurses seem as popular with patients as R.N.'s, but this is not the case with physicians.

The report indicates a most unsatisfactory state of affairs among nurses, especially those not in institutional or public health work. Of those in private duty, 55 per cent plan to remain in the field, while among public health and institutional nurses the corresponding figures are 86 per cent and 82 per cent. Part of this discontent arises from the long hours in private duty. Over 56 per cent of home nursing days are on the 24-hour basis, while in hospital service the corresponding figure is only 12 per cent. The pay is low, does not vary with ability and experience, and there is no future to private nursing. The typical private duty nurse gives about 1 month out of 12 to free service.

In its discussion of the implications of the facts ascertained the committee makes several useful suggestions, while at some places it admits it has no immediate solution to offer.

The investigation has been thorough, the conclusions being based upon 34,000 returns from nurses, 28,000 from physicians, 3,400 from hospitals, and 3,200 from patients, registrars, etc. The book is easy to read and easier to remember because of the summary at the end of each chapter. The liberal use of good diagrams also aids the presentation. The practice of giving excerpts from letters of physicians, nurses and patients has helped in giving an adequate picture of the situation, as well as making the volume more readable.

This committee is composed of 21 members representing nurses, doctors and the public, and is sponsored by the American Medical Association,

the American College of Surgeons, the American Hospital Association, the American Nurses' Association, the National League of Nursing Education, the National Organization for Public Health Nursing, and the American Public Health Association. Its ultimate purpose is "the study of ways and means for insuring an ample supply of nursing service, of whatever type and quality is needed for adequate care of the patient, at a price within his reach." To accomplish this, a 5-year program of research has been outlined of which this volume covers the first project. The other two studies, which will be looked forward to with undoubted interest because of the high quality of this first report, will be "What nurses need to know and how they may be taught" and "The grading of schools of nursing."

ALLAN PEEBLES

A Manual of Tuberculosis Legislation—By James A. Tobey, LL.B., Dr.P.H. New York: National Tuberculosis Association, 1928. 86 pp. Price, \$.50.

This manual is the eighth of a series of technical publications issued by the National Tuberculosis Association.

In Part I of the manual, the underlying principles of tuberculosis legislation are discussed. This is followed by an outline for a state legislative program against tuberculosis, with practical hints on law making. Part II consists essentially of an analysis of existing state and county tuberculosis legislation, arranged according to subject matter. It includes a consideration of general public health administration, reporting and legislation, control of cases and contact, establishment and maintenance of sanatoria, and miscellaneous measures. Part III supplies an index to tuberculosis legislation by states, arranged in alphabetical order, and a chronology of important legislation from 1893, when Michigan required reporting by a regu-

lation of the State Board of Health, to 1909, when New York and Ohio each passed county sanatorium laws, the first in the United States.

The information is complete but concise, and so well arranged that the book serves as a ready reference on any topic concerning tuberculosis control by legal or legislative means.

H. E. KLEINSCHMIDT

Directory of Psychiatric Clinics for Children in the United States.
New York: Commonwealth Fund Division of Publications. 187 pp. Price, \$.75.

This Directory presents the results of a recent survey of clinical facilities for child guidance throughout the United States, made by the Division on Community Clinics of the National Committee for Mental Hygiene. Under each state is given a list of local clinics providing regular service for the study and treatment of conduct problems, the number of children handled in each clinic during the past year, and a description of the institutions and community resources in mental hygiene under state governmental auspices, as well as the names, addresses, and chief activities of state and local mental hygiene societies.

How You Can Keep Happy—By William S. Sadler, M.D., F.A.C.S.
Chicago: American Health Book Concern, 1926. 292 pp. Price, \$3.00.

The basis of this book is the conviction, which the author seems to claim as his own, that happiness in living is largely a question of emotional control. If we succeed in having certain emo-

tions and sentiments dominate us, our life is joyful, while, on the other hand, allowing our more primitive and less desirable emotions to control us brings sorrow, fear and unhappiness. The most interesting part of the book is Part IV dealing with the methods of emotional control.

There is nothing new in the book, but the material is interestingly presented, and will doubtless be of aid to certain types of people who have not cultivated self-control and to those who desire to do so. M. P. RAVENEL

Recent Advances in Chemistry in Relation to Medical Practice—
By W. McKim Marriott. St. Louis: Mosby, 1928. 141 pp. Price, \$2.50.

This small volume is a reprint of the six lectures given by the author at the San Diego Academy of Medicine in 1926. The lectures were given to show the application of some of the fundamental principles of chemistry to the practice of medicine and its extensive development in recent years.

In the first chapter of the book, brief discussions are given of such fundamentals as the structure of atoms and molecules, ionization, hydrogen ions and their values, surface tension, osmotic pressure and colloids. In the remaining chapters these principles are applied to acidosis and alkalosis, the chemistry of the blood, foods and metabolism and the endocrines and their clinical application.

This little book will be especially valuable to medical graduates of a few years ago by whom recent chemical literature may not be easily understood.

A. B. HAW

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Providence, R. I.—The forty-fifth annual report of Providence for 1927 records a population of 272,400, a birth rate of 11.6, and a marriage rate of 16.3 per 1,000 population. As in previous years, a classified financial statement compares the expenditures in 1926 with those in 1927, the latter amounting to \$205,182 (\$127,158 garbage removal contract). An appraisal of all health activities in the city, on the A. P. H. A. Appraisal Form, gives a rating of 851.6 as compared with 816.8 for 1926. The principal increases are noted under activities of child hygiene, including prenatal, preschool, and school, and under communicable disease control, especially immunization.

The first step in the supervision of the health of infants is the distribution of prenatal letters to prospective mothers each month. In 1927 there were 1,068 requests for such letters as compared with 897 in 1926. Five nurses supervise, until they are 3 years old, the children delivered by midwives (10.8 per cent of total live births), making each well baby ten calls before it is 1 year of age, and as many other calls as are necessary if the child becomes sick. One nurse supervises the infants and young children in licensed boarding homes, and the infants of such unmarried mothers as are not under the supervision of private agencies. One nurse from the department makes one visit upon each infant delivered by a physician, provided the mother is not on the maternity service of the Providence District Nursing Association or delivered at the Lying-in Hospital. An infant mortality rate of 63 for 1927 is recorded.

Three important changes were made during the year in the methods of garbage collection and disposal: (1)

transfer of the control and management from the health department to the Commissioner of Public Works; (2) arrangement for collection and disposal by the municipality rather than by contract; and (3) adoption of incineration rather than feeding to swine. "In Providence, as in all other cities in former years, garbage disposal was considered an important health problem, and although it is now known to have practically nothing to do with health, the force of tradition has kept it in this department."

Worcester, Mass.—The 1927 Massachusetts legislature passed an act establishing a standard for ice cream and regulating its manufacture and sale. "All such places (in Worcester), when it was proposed to manufacture ice cream, have thus far been thoroughly inspected by the entire board." New regulations were adopted during the year concerning the handling of milk, pasteurization, and the care of plants and utensils.

A birth rate of 23.3, a general death rate of 13.1, and an infant mortality rate of 57 are reported for 1927. Several good statistical charts are features of the report.

New Britain, Conn.—The annual report for the year ending March 31, 1928, opens with a concise statement of the different functions of the department. An annual expenditure of 79½ cents per capita is noted for this city of about 70,000. An infant mortality rate of 71.2 is recorded, with a general death rate of 8.2. There were 32 diphtheria cases reported with 1 death, and 102 tuberculosis cases reported with 40 deaths. It is reported that this city, together with several surrounding towns,

is on the state and federal accredited list, "which means that all bovine animals within those areas are regularly tuberculin tested at state expense."

Illinois—The annual report for the year ending June 30, 1927, describes the work of the department of public health for the 50th year since the law creating the first state health service in Illinois became effective. A history has been prepared which covers this 50-year period. It is stated that the most noticeable change in conditions is the fact that whereas the summer season was formerly more unhealthful, as indicated by mortality statistics, now the winter and spring months are less favorable. Sickness and mortality now fall to a minimum during August and September, whereas February, March, and April make up the quarter when illness and mortality reach maximum levels. Decreases in diseases such as typhoid, malaria, dysentery and diarrhea, are largely responsible for this change. In 1926, typhoid and diphtheria prevalence reached the lowest points recorded in the history of the state.

This report contains accounts of divisional activities, with several good charts and excellent photographs. In the child hygiene and public health nursing section, it is learned that the department of public health and child welfare of the Illinois Federation of Women's Clubs decided to sponsor a preschool child health program for a period of 5 years. Each club woman agreed to be responsible for the examination of one child each year, this being done by the family physician and family dentist in their own offices. The program was outlined and standardized by a committee made up of representatives of the state medical and dental societies, the Federation of Women's Clubs, and the Division of Child Hygiene of the state. During the year, a preschool examination card was pre-

pared, and more than 40,000 of them were requested for use by various groups, while members of the division assisted with the examination of more than 7,000 preschool children.

In cooperation with a plan accepted by the presidents of the five state teachers colleges for a course in health education for students in teacher training institutions, and in order to impress the prospective teacher with the value of a complete physical examination as the basis for health education, to collect information regarding health conditions of the future teachers, the State Department of Public Health offered the services of a physician (cooperating with the local medical and dental profession) as a demonstration measure. Over 1,400 students were subsequently given physical examinations at three of the five state teachers colleges.

White Plains, N. Y.—Printed in good readable type, on soft paper, with excellent statistical tables and graphs and a few photographs, the 1927 health department report of White Plains is a credit to this city of 29,888 people. Scored on the Appraisal Form of the A. P. H. A. by the health officer, a rating of 865 out of a possible 1,000 points is obtained. This rating includes the health practices of all agencies participating in the community health program. A birth rate of 20.8, a general death rate of 9.6, and an infant mortality rate of 49 are recorded.

Increased laboratory examinations are noted during the year. These include Wassermann tests, Widal tests, and examinations of water, milk, and ice cream, as well as of other routine specimens. The work in child hygiene and tuberculosis clinics has expanded, weekly clinics having been held under the direction of a local physician. Department nurses made 2,977 home visits for the purpose of seeing babies and prenatal cases, of following up cases of

tuberculosis and venereal diseases and of interesting patients in regular attendance. Little Mothers' Leagues and Junior Health Leagues have been organized in schools.

Expenditures for health work by the Department of Education amounted to 56 cents per capita, by the Nursing Association to 84 cents per capita, while the amount spent for the care of cases of contagious disease, acute venereal disease, tuberculosis and psychopathic cases was \$1.76 per capita. "If the amounts spent by the various organizations mentioned above are added to the amount of the health department budget, the total amount spent for health activities in White Plains during 1927 was \$4.11 per capita."

Baltimore, Md.—Baltimore had an estimated population in 1927 of 819,012, of whom 121,296 were colored. Birth rates of 18.5 for the white population and 27.7 for the colored population, with death rates of 12.3 and 24.4 respectively, were recorded. Detailed statistical tables in the last report include data regarding population and deaths beginning with 1875. For the current year, deaths are analyzed by age, sex, month and cause, while births are classified by nativity. The infant mortality rate of 81.6, 69.9 for whites and 127.0 for colored persons, is lower than for previous years.

Tables are presented to show that 58,323 children have been immunized by toxin-antitoxin, 1922-1927, of whom 16,430 were pupils entering school, and 9,173 were preschool children. Other data include a compilation of questionnaires sent to physicians who used scarlet fever serum, the general tone of the responses being favorable as regards treatment results.

Regulations governing the manufacture of ice cream require that cream be produced from milk which is of the same grade and quality as that milk

which is used in the regular bottle trade. In the milk division, also, measures were enforced for proper cleansing of milk bottles, followed by steaming or chlorination.

This report of 256 pages contains a table of contents at the front, and an alphabetical index at the back. A classified financial statement shows expenditures amounting to \$790,434 during 1927. The report is printed in good readable type, and is bound in attractive soft blue paper covers, with a well-arranged title page.

East Orange, N. J.—During 1927, 74 per cent of the 1,308 births in this city of 66,640 population occurred in hospitals, while 32 per cent of the 658 deaths occurred in hospitals. Births and deaths are analyzed by wards and nationality, and the latter are also classified by cause in accordance with the International List. The fly leaf of the report carries a diagrammatic sketch of the comparative ratings of the city activities based on the Appraisal Form, 836 having been obtained in 1925 and 900 in 1927. The last three pages of the report are devoted to a statement of the finance committee, which includes a detailed classification of expenditures. The appropriation for 1927 was \$43,836.

Fully 80 per cent of the school children have been protected against diphtheria and an increasing number of preschool children are being so protected by the family physician. There were 42 cases of diphtheria with no deaths, 33 of the cases occurring in children under 10 years of age who had not been immunized. During the year, 186 persons were bitten by vicious dogs, and 7 dogs were found to have rabies. The Board of Health has recommended that a city ordinance be passed requiring vaccination against rabies as a prerequisite to licensing of dogs, but no action along this line has resulted.

The report is written in accordance with the outline of the Appraisal Form and contains an immense amount of interesting data for health officers of cities of this size. There are many good statistical tables and graphs with appropriate descriptive text.

Scotland—The population of Scotland in 1927 was 4,894,700, and the general death rate was 13.5 per 1,000, while the death rate from tuberculosis was 99 per 100,000, and the infant mortality rate was 99 per 1,000 births. Since 1890, local authorities have had power to provide houses for the working classes, although this was little used until 1919. During 1927, the total number of working class houses erected was 21,660. As it is estimated that 10,000 are required annually to meet normal requirements, there is now believed to be a substantial number of houses to set against the great shortage,

estimated by the Royal Commission in 1917 to amount to 121,430 houses.

Another feature of the year, according to the ninth annual report of the Scottish Board of Health, was the launching of a scheme of contributory old age pensions, which, together with contributory pensions for widows and orphans initiated in 1926, completed the system of contributory pensions—now reaching more than 150,000 persons.

There were two major outbreaks of infection during the year, one a widespread epidemic of influenza, and the other of smallpox. The latter disease, involving 155 cases, was of a mild type, resembling the type found in recent years in England. The principal causes of death in order of magnitude during the year were as follows: heart disease, "malignant disease," apoplexy, pneumonia, bronchitis, diseases of early infancy, tuberculosis, influenza, nephritis and diarrhea and enteritis.

BOOKS RECEIVED

- THE PICKETT-THOMSON RESEARCH LABORATORY. Vol. IV, Part 1. The Pathogenic Streptococci. London: The Pickett-Thomson Research Laboratory, 1928. 250 pp. Price, \$10.00.
- HUNGER FIGHTERS. By Paul de Kruif. New York: Harcourt, Brace, 1928. 377 pp. Price, \$3.00.
- MARRIAGE STATISTICS. New York State (Exclusive of New York City), 1921-1924, with Introductory Analysis of Marriage Statistics, 1916-1924. By J. V. DePorte, Ph.D. Albany: New York State Department of Health, 1928. 257 pp.
- CHEMISTRY IN MEDICINE. Edited by Julius Stieglitz. New York: Chemical Foundation, 1928. 757 pp. Price, \$2.00.
- PRINCIPLES OF SOCIOLOGY. By Rudolph M. Binder, Ph.D. New York: Prentice-Hall, 1928. 609 pp. Price, \$5.00.
- SPASMOPHILIA. By Edward C. Wrightsman, M.D. Boston: Gorham Press, 1928. 155 pp. Price, \$2.00.
- THE RISE AND FALL OF DISEASE IN ILLINOIS. Vol. II. Isaac D. Rawlings, M.D. Springfield: State Department of Health, 1927. 493 pp.
- HEALTH READERS: Book Three. The Road of Health to Grown-up Town. By Lummis & Schawe. New York: World Book Co., 1928. 152 pp. Price, \$.76.
- THE BASIS OF BREEDING. By Leon F. Whitney. New Haven: Fowler, 1928. 260 pp. Price, \$3.00.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

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AKIN, C. V. Fumigation with Cyanogen Products. Pub. H. Rep., 43, 41: 2647 (Oct. 12), 1928.

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ALBUS, W. R. Some Observations on the Plate-Count Method of Enumerating Bacteria in Milk. J. Bact., 16, 4: 269 (Oct.), 1928.

Massachusetts Cancer Campaign—An account of the state-wide cancer campaign and the results in increased attendance upon private practitioners and public clinics for diagnosis and help which resulted.

BALCH, F. G., *et al.* Results of the Massachusetts Cancer Campaign. New England J. M., 199, 9: 430 (Aug. 30), 1928.

Swimming Pool Sanitation—A study of swimming pool sanitation in Great Britain leads the author to conclude that safe conditions can be maintained only by keeping the residual chlorine content at from 0.2 to 0.5 part per million.

BOWES, G. K. The Bacterial Examination of Water in Public Swimming Baths. J. State Med., 34, 9: 521 (Sept.), 1928.

Value of Health Examinations—The author presents a distorted picture of the periodic health examination and its result upon one unbalanced patient. He concludes by devious reasoning that

the evidence for the health audit "has the same general character as that submitted to Ponce de Leon." The paper is typical of the magazine in which it appears and the harm that it will do is therefore problematic.

CLENDENING, L. Health Audits. Am. Mercury, 15, 58: 145 (Oct.), 1928.

Influences in Life Conservation—Both the practicing physician and the sanitarian have indispensable parts in saving lives; the interrelationships and mutual dependence, one on the other, are arrestingly presented.

CALVER, H. N. Retail or Wholesale Life Saving: Which Pays Best? J. A. M. A., 91, 17: 1284 (Oct. 27), 1928.

Recording Children's Development—A description of a method of photographing the front and lateral views of children for a stereoscopic record, affording an excellent means of visual comparison.

CLOUGH, H. D., and MURLIN, H. D. Permanent Records of Growth and Nutrition of Children. Am. J. Dis. Child., 36, 3: 425 (Sept.), 1928.

The Tuberculosis Problem—A British symposium on tuberculosis preventive measures emphasizing the failures as well as the successes of the anti-tuberculosis movement.

COURTS, F. J. H., *et al.* The Present Position of the Tuberculosis Problem. J. Roy. San. Inst., 49, 3: 65 (Sept.), 1928.

Deafened Children—A second report on tests of children's hearing by means of an audiometer. Annual tests of the school child's hearing are again urged.

FOWLER, E. P., and FLETCHER, H. Three Million Deafened School Children. J. A. M. A., 91, 16: 1181 (Oct. 20), 1928.

Infant Diet Self-Selection—A very interesting record of allowing the self-selection of a wide variety of food-stuffs by newly weaned infants. Should be read by all who are concerned with the care of infants; so interestingly told that all will enjoy reading it.

DAVIS, C. M. *Self-Selection of Diet by Newly Weaned Infants.* *Am. J. Dis. Child.*, 36, 4: 653 (Oct.), 1928.

Tularemia—A timely paper on the symptoms, diagnosis, pathology and prevention of tularemia. The wearing of rubber gloves by those who hunt or cook rabbits occasionally is sufficient, but for others who handle rabbits frequently some protective treatment is needed.

FRANCIS, E. *Symptoms, Diagnosis and Pathology of Tularemia.* *J. A. M. A.*, 91, 16: 1155 (Oct. 20), 1928.

Health Education Values—Arguments are presented to indicate the place of popular health instruction in furthering public health consciousness, the prevention of disease, and the promotion of effective therapeutics.

GALDSTON, I. *Tuberculosis Prevention and Health Education.* *Am. Rev. Tuberc.*, 18, 8: 264 (Sept.), 1928.

Eskimos' Susceptibility to Colds—Whenever an outsider visits an Eskimo colony, even though he is without symptoms, an epidemic of colds is started. Adult Eskimos are invariably Schick negative though the disease is unknown and the children are usually Schick positive. All are Dick negative.

HEINBECKER, P., and IRVINE-JONES, E. I. M. *Susceptibility of Eskimos to the Common Cold and a Study of their Natural Immunity to Diphtheria, Scarlet Fever and Bacterial Filtrates.* *J. Immunol.*, 15, 5: 395 (Sept.), 1928.

Infant Mortality—Respiratory infections, not gastrointestinal, are the commonest causes of infant mortality and are not controlled effectively. The

limitations of prenatal care in controlling neonatal mortality are considered.

HERMAN, C. *Some Factors in the Infant Mortality Problem.* *New York State J. M.*, 28, 18: 1087 (Sept. 1), 1928.

Diphtheria Immunization Campaign—This is the story of the effort to induce the mothers of Schenectady to have their preschool children immunized by the family physician. A valuable record.

GILMARTIN, H. A. *The Medical Society's Share in Protecting the Children of Schenectady against Diphtheria.* *N. Y. State J. M.*, 28, 18: 1097 (Sept. 1), 1928.

British Milk Supplies—The condition of the milk supply of Leeds, England, the lack of effective control and the absence of pasteurization, will afford an interesting comparison with conditions in comparable American communities.

JERVIS, J. J. *The Milk Supply of Leeds.* *Med. Off.*, 40, 14: 147 (Oct. 6), 1928.

Measles Prevention—An historical and critical review of the bacteriological and immunological researches into the prophylaxis and therapeutics of measles.

KATO, K. *The Bacteriology and Sero-therapy of Measles.* *Am. J. Dis. Child.*, 36, 3: 526 (Sept.), 1928.

Acidophilus Products—Of 8 commercial acidophilus products only 5 bore any information on the label as to number of viable organisms per unit; of these only 3 fulfilled the claims.

KOPELOFF, N., *et al.* *Commercial Acidophilus Products.* *J. A. M. A.*, 91, 16: 1187 (Oct. 20), 1928.

Milk and Leafy Vegetables—A chapter from McCollum emphasizing the value of milk and leafy vegetables as foodstuffs supplemental to meat and cereals.

MCCOLLUM, E. V. *Importance of Milk in the Human Dietary.* *Certified Milk*, 3, 29: 3 (Sept.), 1928.

Mussel Poisoning—An account of an epidemic of food poisoning caused by mussels taken from the waters adjacent to San Francisco.

MEYER, K. F., *et al.* Mussel Poisoning. *J. Prev. Med.*, 2, 5: 365 (Sept.), 1928.

Immunization with Anatoxin—A report of successful experience in immunizing against diphtheria with anatoxin (toxin treated with formalin) in France. Its use is advocated because of the high incidence of immunity produced, because its use is freer from accidents, and it cannot sensitize the patient to serum.

RAMON, G., AND HELIE, G. I. Diphtheria Prophylaxis in France. *J. A. M. A.*, 91, 14: 1028 (Oct. 6), 1928.

Antigenic Properties of Ultraviruses—Herpes-encephalitis virus, like vaccinia and rabies, produces no complement fixing or precipitating antibodies, but does produce virulicidal antibodies.

SCHULTZ, E. W., and HOYT, J. Studies on the Antigenic Properties of the Ultraviruses. *J. Immunol.*, 15, 5: 411 (Sept.), 1928.

Decline of Communicable Diseases—A broadly philosophic discussion of the individual environmental and social factors which tend to limit the spread of infections. The importance of animal reservoirs for the spread of disease to humans is discussed, as is the lack of knowledge of the natural history of diseases. A very important paper.

SMITH, THEOBALD. The Decline of Infectious Diseases in Its Relation to Modern Medicine. *J. Prev. Med.*, 2, 5: 345 (Sept.), 1928.

Epidemiologic Principles—A rather ponderous presentation of the more obvious principles of epidemiology, which the author states cannot be found

in any one book. We suppose he refers to books in Great Britain, for the principles are set forth in the standard American textbooks.

STALLYBRASS, C. O. The Principles of Epidemiology. *J. State Med.*, 34, 9: 510 (Sept.), 1928.

Health of Negro Children—A detailed biometric study of 5,000 negro school children in Atlanta in which the heights and weights of both sexes are recorded, and other important information such as the incidence of defects. A useful document.

STERLING, E. B. Health Studies of Negro Children. *Pub. Health Rep.*, 43, 42: 2713 (Oct. 19), 1928.

Supplying Human Milk—An account of the way human milk is collected, tested, bottled, pasteurized and distributed to needy children.

TALBOT, F. B. An Organization for Supplying Human Milk. *New England J. Med.*, 199, 13: 610 (Sept. 27), 1928.

Prophylactic Measures—This is a very valuable and inclusive summary of the prophylactic and treatment agents for twenty communicable diseases.

WHITE, B. Serums and Vaccines in the Prevention and Treatment of Infectious Diseases. A Critical Review. *New England J. Med.*, 199, 11: 505 (Sept. 13), 1928.

Preventive Medicine—Public and Private—A very frank discussion which faces courageously the vexing questions which inevitably arise between the private practitioner and the extension of the non-official and official health programs.

WILLIAMS, L. R. Present Status of the Practice of Medicine. *New York State J. Med.*, 28, 17: 1027 (Sept. 1), 1928.

NEWS FROM THE FIELD

PUBLIC HEALTH IN EUROPE

A SURVEY of the development of public health programs in foreign countries has recently been given by J. H. Mason Knox, Jr., M.D., Chief of the Bureau of Child Hygiene, Maryland State Department of Health. Dr. Knox attended the International Congress for the Protection of Infancy in Paris in July. He states:

One of the most noticeable changes is the increase in public health nurses, for during the war this activity was almost unknown. Now there are 1,500 full-time public health nurses in France. Their training for the most part has been based on the training given to nurses in this country. There has also been an increase in full-time health service in France; out of 89 departments there are 52 having full-time health officers. France has organized a rather extensive child health program and appropriations have been made by the government to many private agencies such as maternity homes, day nurseries, vacation colonies and preventoria for children threatened with diphtheria.

Throughout Europe there is a growing interest in the establishment of open air schools for both underweight and normal children. In Amsterdam the American visitor finds many child health stations where the work is conducted by a physician, several nurses, a midwife and social worker. The health station refers cases needing medical attention to the family physician, or in case of economic pressure the city health department provides for the necessary treatment. Instruction in personal hygiene and the prevention of disease is given at the health stations.

About 20 years ago Denmark organized breast-feeding stations which are being maintained now in Copenhagen. Babies who are wholly or in part breast-fed are brought to these stations. At frequent intervals they are brought back for reexamination and weighing. The mothers receive instructions and are given allowances of milk for their own daily use. Bottle-fed babies are not received at these stations.

According to the Child Welfare Act passed in 1925 every parish in Denmark constitutes a child welfare district. A child welfare council in each district is responsible for the care of dependent or abused children in that section. Insurance societies providing sick benefits are popular in Denmark and provide benefits during and after childbirth.

Sweden operates its child health program in an entirely different way. The country is divided into 2,000 sanitary districts and in each there is a children's committee, composed of a local physician, minister, school teacher and selected citizens. This committee takes charge of the health of dependent and problem children.

Sweden is also doing excellent work in the control of infectious diseases. Hospitals for the care of patients with infectious diseases have been established under government control. The government is supporting 7,000 beds in the larger cities and rural districts.

In Norway there is a system of sanitary districts presided over by a sanitary council, which is headed by a medical officer, usually a practitioner. All public health activities come under control of this medical officer, including the control of epidemics, medical assistance

to the needy and care of the insane. Norway is divided into 1,000 districts and each is provided with an official midwife who gives care to mothers in childbirth.

In 1926 Norway appropriated about \$7,000,000 to the public health department, which represents nearly one-thirtieth of its entire appropriation of \$218,000,000.

AMERICAN FOUNDATION FOR MENTAL HYGIENE

THE American Foundation for Mental Hygiene has been established according to the announcement made at the 19th Annual Meeting of the National Committee on Mental Hygiene recently held in New York, N. Y.

Clifford W. Beers, secretary of the committee, outlined the purpose and scope of this new Foundation. In part Mr. Beers explained:

It is the first Foundation organized for the exclusive purpose of financing and doing work that will enable men, women and children to live happier, healthier and more efficient lives through a better understanding and management of the processes of their minds and of the controlling forces in human behavior.

Although the Foundation was started without an endowment, Mr. Beers announced that the Foundation has received \$50,000 from the estate of Mrs. John L. Kane, and another \$100,000 has been pledged on the condition that \$900,000 more is raised. The \$50,000 will be used toward defraying the expenses of the First International Congress on Mental Hygiene, scheduled for 1930.

NEW CANCER COMMITTEE

DURING the 57th Annual Meeting of the American Public Health Association in Chicago in October, 1928, a new National Cancer Committee and a Chicago Committee were organized. These committees are not committees of the A. P. H. A.

The functions of these committees

have not been definitely outlined, but preliminary organization announcements stated that "they would coördinate, if possible, and pass on some of the present methods of cancer treatment."

Actual clinical work will be performed at the Cook County Hospital and Oak Forest Sanatorium of Chicago under the direction of the proposed local committee consisting of: Frank Billings, M.D., Herman N. Bundesen, M.D., Mrs. Wilber R. Cubbins, Gilbert Fitzpatrick, M.D., Ludwig Hektoen, M.D., L. L. McArthur, M.D., Joseph L. Miller, M.D., Frank Morton, M.D., William A. Pusey, M.D., John E. Tuite, M.D., and Gideon Wells, M.D.

The proposed National Committee consists of: Dr. J. C. Bloodgood, Baltimore, Md.; R. C. Coffey, Portland, Ore.; W. B. Coley, New York, N. Y.; Leonard Freeman, Denver, Colo.; W. D. Haggard, Nashville, Tenn.; F. H. Lahey, Boston, Mass.; Otis Lamson, Seattle, Wash.; N. J. MacLean, Winnipeg, Can.; U. Maes, New Orleans, La.; Angus McLean, Detroit, Mich.; James F. Peroy, Los Angeles, Calif.; Emmett Rixford, San Francisco, Calif.; and C. L. Starr, Toronto, Can.

In making announcement of the organization of the committees C. H. Mayo, M.D., at the Chicago meeting said it would provide a central point to which would be brought all information on any aspect of cancer collected, where further investigations could be planned, and from which information could be given out.

LEE, MASS., FOLLOWS OLD PROCEDURE

DESPITE the fact that Lee, Mass., recorded 900 cases of septic sore throat with more than 40 deaths this summer due to milk from an infected cow which was distributed raw among customers, the town has not passed regulations regarding the pasteurization

of milk. However, one pasteurizing plant has been installed in the vicinity of Lee since the epidemic but there is no community law demanding that all the milk distributed and consumed by the population of Lee be pasteurized.

MICHIGAN P. H. A. CONFERENCE

THE Michigan Public Health Association will hold its annual conference with the Michigan State Department of Health in January.

TRIBUTE TO CHARLES B. BALL

IN paying tribute to Charles B. Ball, for a quarter of a century chief sanitary inspector of the Chicago Health Department, whose death occurred while he was at his desk the middle of October, the *Chicago Daily News* editorially pays tribute also to the many men and women who are devoting their efforts to public health.

It says:

The value of such men to a community is inestimable. It is their work which makes it possible for us to live in spite of the politicians. Mayors and aldermen come and go—there have been many since 1904 when Charles B. Ball came from New York to Chicago to take up his work in this city's administration—but it is the men in the *continuous service* of the city, men expert and trained, men who love the work they do and do it with intelligent enthusiasm and unfailing fidelity, who make life tolerable and safe for us. Take them out of the machinery of government and leave us only the elected and politically appointed heads of departments, and we would be soon in a disastrous mess.

There are others than Charles B. Ball in the service of the city, and we pay them all a tribute in paying this tribute to him.

NEW YORK CITY'S DEPARTMENT OF HOSPITALS

A NEW Department of Hospitals has been organized by Mayor James J. Walker of New York City which will begin to function February 1, 1929.

The bill was passed by both branches of the Municipal Assembly.

Under this plan all the hospitals controlled by the city will be reorganized. At present several are under the direction of the Department of Health; the Department of Welfare and another group are directed by the trustees of the Bellevue and Allied Hospitals. According to the new arrangement these three groups will come under the direction of one head to be known as Commissioner, whose appointment will be announced later.

Preceding the signing of the bill by Mayor Walker making this organization a reality there was a hearing in which representatives of several civic and welfare organizations participated.

PREVENTIVE MEASURES IN NEW MEXICO

IN Dona Ana County, C. W. Gerber, M.D., Health Officer, is directing a house-to-house canvass for the purpose of discovering all malaria cases and carriers in the county. This survey is made possible by a number of public health nurses added to the county health department's staff.

A toxin-antitoxin campaign is being carried on in Colfax and Mora counties under direction of the health officers, H. W. Heymann, M.D., and J. J. Johnson, M.D. They are aiming at the inoculation of every child who has not received previous treatment.

ABRAHAM FLEXNER LECTURESHIP

VANDERBILT University School of Medicine has recently announced the inauguration of the Abraham Flexner Lectureship, established through the generosity of Bernard Flexner of New York, N. Y. There will be delivered a series of 5 lectures, the first lecturer being Dr. Heinrich Poll, director of the Institute of Anatomy of the faculty of University of Hamburg, Germany.

PERSONALS

R. S. CRAIG has been appointed Director of the Bureau of Chemistry and Food, Baltimore, Md., to succeed Dr. J. H. Shrader, resigned. Mr. Craig has been with the Baltimore City Health Department for 15 years and for 6½ years has been assistant director of the bureau.

DR. CLAIR V. LANGTON, formerly a member of the faculty of public health, University of Michigan, has resigned to become head of the Department of Public Health at the University of Oregon.

DR. ALONZO F. MYERS, formerly a member of the executive committee of the Ohio Public Health Association, has accepted a position as State Director of Teacher Training in Connecticut. He will be in charge of four state teachers' colleges, and will direct the summer session of the state department, held at Yale University, New Haven, Conn.

DR. R. JODOROLA has been appointed city Health Officer of Los Banos, Calif., to succeed Dr. B. H. Bush.

DR. J. A. DE SERPA has succeeded Dr. Louis Achenback as city Health Officer of Ventura, Calif.

DR. H. W. COMFORT is city Health Officer of Fortuna, Calif.

DR. H. B. NEAGLE has been appointed Health Officer of Madera County, Calif., to take the place of Dr. Smith A. Quimby.

GROVER C. MULL of Menlo Park, Calif., has succeeded Clarence R. Walter as city Health Officer of Atherton, Calif.

DR. LEROY B. DUGGAN, Belton, Tex., has been made assistant director of health of the Dallas, Tex., public schools. He succeeds Dr. L. E. Hamilton, who resigned.

DR. ROGER I. LEE, professor of hygiene of Harvard University Medical School, Boston, Mass., has been made chairman of the committee on public

health of the Boston Chamber of Commerce.

DR. H. E. LEFEVER, formerly resident physician at the Franklin County Tuberculosis Sanatorium, Columbus, O., is associate director of student health at Ohio University, Athens, O.

DR. FERDINAND R. KREMBS has been appointed Health Officer for the city of Stevens Point, Wis.

SIR SAMUEL SQUIRE SPRIGGE, London, England, editor of *The Lancet*, is visiting schools of medicine in this country and Canada. Sir Samuel Sprigge expects to visit 8 universities in the United States and 2 in Canada before returning to England where he will make a report on medical education in this country.

DR. WILLIAM H. O'NEIL has been appointed Health Officer of Ansonia, Conn.

CONFERENCES

December 3-7, Radiological Society of North America, Chicago, Ill.

December 7-8, New Jersey Public Health and Sanitary Association, Princeton, N. J.

December 13-15, American Vocational Association, Philadelphia, Pa.

December 26-29, American Association for Labor Legislation, Chicago, Ill.

December 26-29, National Community Center Association, Chicago, Ill.

December 27-29, Society of American Bacteriologists, Richmond, Va.

December 27-January 2, American Association for the Advancement of Science, New York, N. Y.

December 28, International Congress of Tropical Medicine and Hygiene, Cairo, Egypt.

December 29, American Student Health Association, New Orleans, La.

January 22-23, Southwestern Tuberculosis Association, Ft. Worth, Tex.

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